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GLEANNINGS

A JOURNAL DEVOTED
TO BEES
AND HONEY
AND HOME
INTERESTS.

BEE CULTURE

ILLUSTRATED
SEMI-MONTHLY

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DID YOU EVER notice that all basswood leaves are lop-sided—*oblique*, the botanists call it? The picture in the ABC shows it plainly, but I suspect not one in ten ever noticed it.

C. DAVENPORT gives in *American Bee Journal* a kink worth considering: Keep hives intended for swarms in a cool, airy place. A swarm put into a hot hive that has been standing in the sun is much more likely to desert.

THROUGH MY FAULT or the printer's, more is claimed for the Bosnian bees, in a Straw, than the most extravagant claims I have met. I wrote, or intended to write, "sting less, work more," and the types make it "stingless," p. 425.

H. L. JONES, I have respect both for scientists and practical men (including the Jones family in the latter), and when they disagree it's a good plan to lean toward the safe side, so I always use very young larvæ for queen-rearing, especially since the bees, when left to their own choice, do not select the older larvæ.

NINE CHANCES in ten, these bees of E. B. Beecher's, p. 441, decamped because a very hot day came on after they had got a start in comb and eggs. Keeping the hive shaded and cool till the bees have too much to leave, is important. If a frame of brood is given, they can hardly afford to leave that. [I am inclined to think you are right.—ED.]

ONE OF THE FIRST and surest signs of laying workers is to find a number of eggs in a queen-cell. But at length I've found an exception. I found a queen-cell with five eggs, and on the same comb another with six, and in the hive was one of the best queens I ever had. She is three years old, and is laying two and occasionally three eggs in a cell, no doubt because the colony is purposely small and she hasn't enough room.

ACCORDING to Prof. Lazenby, we must readjust our ideas about the work of bees, for

he says he never finds bees gathering pollen and honey on the same trip. And there seems to be an unequal division of labor, for those that gather honey take twice as heavy loads as the pollen-gatherers. May be it's harder work to carry at arm's length, as the pollen is carried—or is it at leg's length?

THE PLAN you give, p. 444, Mr. Editor, for killing cross bees, is the one I've used for a generation; but I never had sense enough to tell of it. [If you had told it, doctor, you would have saved me and others a lot of annoyance. I suspect it is something like your "gobacks" I have described elsewhere in this issue. Don't you remember that you were surprised that I did not know about them, and yet it was a familiar household term in your home?—ED.]

I ARISE to move a vote of thanks to that bright-brained tar-heel, W. H. Pridgen. I've been trying his cell-cups and nurseries, and they're fine. Larvæ transferred with cocoon into the small-bottomed cups are very promptly accepted, this plan having advantages over that of having to use royal jelly. When the cocoons are transferred, there is no question about the jelly being of the right consistency. [I second your motion. But I suspect it was Willie Atchley who first thought of the scheme of transferring cocoons into small-bottom cell-cups.—ED.]

THAT SUMMARY of the big-little-hive controversy in *Bienenzucht* left the matter just where it is left in *American bee-journals*, arguments on both sides given, and you can take your choice. [The question in this country seems to have simmered itself down to this: That some localities are better adapted for the large hives, and others for small ones. The training of the men, coupled with their prejudices, has a good deal to do with it, so that we shall never see the day when either the small or the large hive will be universally adopted.—ED.]

DON'T GET into a row with my friend Burrel, Mr. Editor, p. 442. He's all right in what he says. Bees put pollen in the combs already drawn out, whether in hive or super, if only in one place. So he puts foundation in the super till foundation below is drawn out

enough to catch the pollen, *then* puts on the partly filled sections from the old hive. Friend Burrel, if you want comb in the brood-chamber without having it bulge into the foundation, put a dummy between the combs and the foundation. See if it doesn't work as well as a dummy at the side. [P-e-r-h-a-p-s you are right—I don't know.—ED.]

PROF. LAZENBY makes a statement that would have brought "aid and comfort" to me a few years ago. I insisted bees didn't work on strawberry-blossoms at all. He comes pretty near that, saying they work on weeds among strawberries, seldom touching the latter. I was obliged to admit their doing a little on strawberries. Well, this year the bees take a mischievous delight in showing me I don't know when I think I do. Strawberries by the acre on my place (Ghordis Stull raises them) show the bees working quite busily on them every day. Perhaps another year Prof. L. may find different results. [Nearly every spring our bees are found to be working on strawberry-blossoms. This was especially noticeable a year ago, and it seemed as if every blossom (and there were thousands of them) in our strawberry-bed had a bee on it.—ED.]

"THREE YEARS AGO I extracted about 2000 pounds of nearly pure dandelion honey before white clover commenced to yield," says C. Davenport, in *American Bee Journal*. He says the honey is dark, rank-tasting, fit only for brood-rearing, or to sell for manufacturing purposes. (Doolittle says it is splendid when a year or two old.) Formerly dandelion bloom was about gone soon after fruit bloom, but it has increased so much that now there is too much of it, and the honey is sometimes mixed with that of white clover. About Marengo it has increased to such an extent that it blooms till fall frosts, but I doubt whether the bees work on it much late in the season. [I am glad to know that there are some localities where the bees gather honey from dandelions. They may get a very little from that source here, but I have my doubts about it. But I have seen bees by the hundreds carrying home dandelion *pollen*; and Prof. Lazenby says that bees do not carry both honey and pollen at the same time.—ED.]

A LITTLE MIXED seems the matter of jelly or no jelly in cell-cups. Doesn't it depend on circumstances? I have tried cells without jelly, and had not one accepted. I have tried cells without jelly, and have had them accepted just as well as with jelly. In the latter case the larva was transferred with the bottom part of the cocoon, in a cell-cup specially built for it. In the ordinary Doolittle cups, I don't believe I can get best results without jelly. By transferring cocoon and all, there is no need of jelly; and it is certain that the tiny grub takes with it a ration of exactly the right consistency. [Nothing mixed at all, doctor. Mr. Wardell (perhaps he is prejudiced in favor of his old way) prefers Doolittle cups with large bottoms, with royal jelly. He says he doesn't like to slice across a brood-comb, mutilating larvae of all ages, and young bees, that cups with large bottoms and royal

jelly make him really less labor. You and he agree that with such cups royal jelly is almost a necessity; and he agrees that cups with cocoons, without royal jelly, will be accepted.—ED.]

H. M. JAMESON, in *Review*, thinks I mislead by saying that hives, etc., are cheap enough. I don't know that I ever said so, for I don't know how much profit there is on them; but I know that I can buy them cheaper than I can make them. He says he can pay double price for lumber, and with a foot-power saw make \$3.50 a day cutting and rabbeting hives. Why wouldn't it be a good plan for him to go into the business and furnish hives at lower rates? [If Mr. Jameson is a good mechanic (and there is only about one bee-keeper in a hundred who is) he can, perhaps, make his own hives; but even then I hardly think they would be as accurate as factory-made hives. Perhaps he could make \$3.50 a day; but a shop using power usually estimates the cost of labor, power, machinery, and shop room, at 40 cts. per hour. That he could pay double price for the lumber depends on where he is located; for sometimes freight is a big item. But I'll bet him a cookey that the lumber he uses will not be equal to that found in the factory goods. If every one could do as well it would pay to buy foot power saws and make one's own hives. But hundreds who have tried it have given it up.—ED.]

"THE BEE, quick as thought in the execution of her attack, nevertheless does not inflict a wound until she has examined the nature of the surface to be punctured, using a pair of very beautiful organs called palpi, elaborately provided with feeling-hairs and thin nerve ends. She is never so mad with anger but that she has method in her madness, . . . and some substances, applied to the skin, will almost, if not absolutely, save it from attack."—Cheshire, Vol. I., p. 191. This for the consideration of ye editor. [While I have great admiration for Mr. Cheshire, yet his own statements, viewed in the light of present developments on many a question, show that he is by no means infallible. I need only to refer to Prof. Cook or Mr. Cowan for proof of it. On the point under consideration I think he is clearly wrong. If he had been a more practical man, and had spent more time in the apiary, I think he would have been convinced that there is no substance under the heavens, when applied to the skin, that would "almost, if not absolutely, save it from attack." Cyprians and cross hybrids will make a dart like a bullet; and the idea that they stop to *feel* before they apply their stings is amusing. I do not deny that there are certain organs called palpi; neither would I deny that bees do *sometimes* feel around for a good place to do their job; but that a bee is "never so mad" that it does not feel for a good spot is putting it altogether too strongly. Now, look here, doctor. I feel mad at you because you did not give your *own* opinion. Here you are, leaving me to fight it out with Cheshire, and he is not alive to defend himself.—ED.]



Hot and wet, toil and sweat,
Summer showers at last!
'Mid the flowers and shady bowers
Bees are working fast.

BRITISH BEE JOURNAL.

This journal is always interesting, bees or no bees. Its fine pictures which have been for so long a time a marked feature of it are continually giving one a glimpse into the rural and domestic side of English life so beautifully described by Washington Irving in his Sketch-book. In the issue for May 24 is a picture of an old-time bee-shelter at Heaverham. In a brick wall adjoining the house may be seen what look like the mouths of four bake-ovens, two above two. In each of these is a straw hive, seemingly independent of the weather. But after all I infer the hives are empty, as the increased travel on that road has made the business unprofitable. But it is a strange sight to see bee life so intimately connected with human affairs.

In a previous issue, in speaking of how to sell honey, one man said he would put up a sign, "Honey for Sale from our own Bees," and spend the best part of Saturday and Sunday in selling honey to passers-by. Mr. Quartermain, of Tenby, says, "I take the strongest possible objection to devoting the best part of Sunday in selling honey to the passers-by, for Sunday is a day of holy rest, not one for trade purposes. We have too much Sunday trading, without adding to the mischievous practice."

Concerning a scarcity of water, one correspondent says: "We are hoping for rain, which is badly wanted by every one and by every kind of crop. Water is scarce on some farms, the ponds being empty, and farmers are compelled to draw from deep wells, while, labor being scarce, most farms are short of hands, so there is no prospect of an improvement in that direction. All that the city councils have hitherto done in teaching gardening, fruit-growing, dairying, and bee-keeping does not seem to stem the exodus of the countryman toward the towns, so that the older generation are gradually dying off, and those of the growing generation are looking for 'something better than farm work,' so they say. I think the matter will have to be dealt with by our legislature soon or the consequences will be serious in the country districts. Our bee-keeping industry, notwithstanding its apparent growth as shown by statistics, is gradually declining among agricultural laborers, new methods with modern appliances being beyond the grasp of the laborer, and the old-style crock holding 15 to 30 lbs. of honey is practically unsalable at the present time."

AMERICAN BEE JOURNAL.

An essay read by Herbert Clute at the Wisconsin convention gives one an idea of the immense amount of basswood still to be found in that State, and especially in Clark Co. He says that within two miles of him 4000 basswood-trees fit for lumber may be found, besides the crooked and small ones. Mr. Clute says the bee-pasture will improve as the land is cleared up, as they now have more basswood bloom than the bees can handle.

One correspondent in Dr. Miller's department says that bumble-bees are so plentiful this year that they drove the honey-bees off the best honey-producing plants. He and his family then went to work to destroy the big fellows, and killed 614 queens in two days. That's what I call stupidity if not a great sin. The usefulness of these big bees is unquestionably great, and they should be protected instead of being killed. The whole thing is on a par with the farmer who shot all the swallows around his barn because they took his mud to make nests. In speaking of gill-over-the-ground, the same correspondent says that bumble-bees and honey-bees fill themselves so full of nectar from this plant that they can not fly. But I wish the plant itself could and would fly into the ocean. It's a sticker around here.

Selah Merrill, U. S. consul at Jerusalem, gives an interesting report of Mr. Baldensperger's experience with bees in Syria. Among the drawbacks to apiculture there, may be mentioned Turkish taxation, every hive being taxed 10 cents, and every door, window, and hole in the hive being counted as a hive. Then come large yellow hornets, sparrows, swallows, bee-eaters, badgers, rats, lizards, and moths. But the greatest enemy is man. Where an apiary is set down, the sheiks of the nearest villages like to receive a certain amount of honey, otherwise the bees will be stolen. When a hive is stolen, fire, and sometimes water, is used to destroy them. About a tenth of the honey produced must be given away to induce people not to take the hives. When the hives are being carried from one place to another on camels the Arabs will occasionally steal the animals. These thieves are the descendants of the Midianites of the Bible—those who stole the wheat of Gideon's father. It's a pity Gideon has not been disciplining them in his peculiar way ever since.

AMERICAN BEE-KEEPER.

In the *Amer. Bee Journal* Mr. Rockenback tells a sad story of foul brood in Cuba, and Harry Howe adds, "Foul brood is really much worse than has been described in the papers. Nearly every apiary in Cuba has it." Mr. Hill admits foul brood is prevalent there, but says it is not universal. Colonel Viète, an extensive honey-producer there, says, "I am surprised to hear so much about foul brood. In this part of the island we have none, and my bees are doing beautifully."

GENERAL CORRESPONDENCE

RELATION OF THE HONEY-BEE TO AGRICULTURE.

What Fruits are Most Visited by Bees ?

BY F. GREINER.

The fruit-growers of the present day are becoming more and more convinced of the importance of the part the honey-bee plays in the pollination and cross-pollination of the blossoms of our common cultivated fruits, and that to such an extent that already many orchardists have either themselves engaged in bee culture or have induced bee-keepers to establish apiaries in their localities. The bee-keeping specialist is naturally interested in this matter, although he is viewing it from a different standpoint. It interests him intensely to know from what special fruit-blossoms his bees fill their hives quickest with honey, and from what source they get the most and the earliest pollen, etc. To bring some facts relating to this matter to the notice of the bee-keepers would, it seems to me, be a benefit to them in more than one way; and what I shall say in the following are the observations of noted men as well as our own in orchard and field.

Prof. Lazenby stated before the Ohio Horticultural Society that the apricot was the first of all fruits to bloom, and that the honey-bees would work on these blossoms to some extent. Closely following the apricot he finds the different plum varieties blooming, the Japanese plums blossoming first. All the Japanese varieties are extremely prolific, and from the second and third year after their setting they bloom and bear profusely every year. I am growing Japanese plums and others, and I can truthfully say their tendency to bear fruit is marvelous. Every little twig is so covered with blossoms that they have not room enough to expand. The bees fairly roar in the trees when the weather is suitable.

While plowing and working among my trees I have worked in a regular swarm of bees to my own delight. According to Prof. Lazenby the plum-blossoms yield quite a little honey. The European varieties continue in the bloom, and bees sometimes work for a period of over three weeks on plum-blossoms where the different varieties are grown.

Next, and before the plums are done blooming, the sweet cherries, the sour cherries, the pears, and the peaches furnish a feast for the bees in the order named. Last comes the apple. The apple-bloom is perhaps of the greatest importance to the bee-keeper for several reasons. Apple-trees are most numerous, their blossoms yield more honey than any other fruit-blossoms, the weather is generally more favorable, and the bloom lasts for about two weeks.

Prof. Lazenby observed that plum-blossoms are more freely visited by bees than cherries;

cherry-blossoms, again, more frequently than apple; these more frequently than peach; to pear-blossoms the least attention was paid of any of the fruits. He also noted that, during the time plums and cherries were in bloom, the secretion of honey was gradually increasing from morning to afternoon. He counted the bees that were returning to their hives, and found that, between the hours of 8 and 9, in 30 minutes 1266 pollen-laden bees entered their hives (two in number) against 564 honey-laden bees. Between 11 and 12, in 30 minutes 418 pollen laden bees entered their hives against 2362 honey-laden bees, and between 2 and 3 (afternoon), in 30 minutes 132 pollen-laden bees only were counted against 5154 bees loaded with honey. It seems the bees neglected the pollen in favor of the honey toward and during the afternoon.

I have often noticed that honey-bees are very apt to do that very same thing during any bountiful honey-flow. When the basswood honey-flow is at its best, scarcely any pollen is carried into the hives, although plenty may be had. There seems to be quite a difference in this respect between different colonies. Prof. Lazenby observed, May 7, during apple-bloom, out of 702 in-coming bees of one hive, 164 carried pollen, 538 carried honey; from 825 in-coming bees of another hive, 606 carried pollen and only 219 carried honey—the one colony evidently going in for pollen principally, the other one for honey. It would have been interesting had we been told the exact condition of each of these two colonies as to the amount of brood and open brood; there might also have been a short supply of pollen in one hive, a scant supply of honey in the other, inducing the bees of these two colonies to gather that which was needed most in their respective households. But these are only speculations.

Among the small fruits the professor noticed that red raspberries (blossoms) were most frequently visited by our bees. After those the most attention was paid to the blackberry-blossoms, next to black raspberries, then gooseberries, then currants, and finally strawberries, the latter being almost totally neglected by bees.

I consider the red and black raspberries very valuable as honey-producers in my own locality. There are many extensive fields of black raspberries within reach of my bees, and these fields are fairly roaring at the time of the bloom. The gain in the hives is noticeable, and sometimes sections are filled with a rather dark inferior honey.

If we were to mark the different common fruit-plants on a scale of ten, showing the comparative number of flowers of each visited by bees, the grading would be as follows, according to Prof. Lazenby:

Red raspberry, 9.5; blackberry, 9; plum, 9; cherry, 8.5; black raspberry, 8; apple, 6; gooseberry, 4.5; peach, 3.5; pear, 3; currant, 2; strawberry, 1.

THE WEIGHT OF BEES AND THEIR LOADS.

To the following statements of Prof. Lazenby I now wish to draw the reader's attention, especially as they contain something new to

most of us, and something very interesting indeed.

On the morning of May 17 (probably during the apple-bloom) 16 bees were caught as they came from their hives. They were immediately killed and weighed, each one separately. It was found their weights ranged from .092 gram down to .071 gram.

Right here, again, I will say that it would be interesting to know why this difference between outgoing (empty?) bees. I wish the professor had made a post-mortem examination of these heavy bees. This might have put us in a better position to draw correct conclusions from his observations. His figures do not quite satisfy me. He figures out the average weight of an empty bee at .079 gram. I should not be surprised if that was reckoning it too high. However, there may be that difference of .021 gram between individual bees of one queen's progeny.

The professor, after finding out the weight of outgoing (empty) bees caught 16 incoming bees loaded with honey, and took their weight, each one separately. The heaviest weighed .122 gram, the lightest .073; the average he found to be .094 gram. This makes the average load of honey weigh .015 gram, or about 19 per cent (one-fifth) of the bee's whole weight.

Pollen-laden bees were also caught, killed, and their separate weights ascertained, the same ranging from .075 gram to .098 gram, with an average of .085 gram. Deducting from this the average weight of the outgoing bee we find the average load of pollen that one bee carries to be .006 gram.

On account of the great difference in the weights of the outgoing bees, this manner of reckoning is probably not quite reliable, but it is the best we can do at present.

By his further observations, and by careful counting, the professor is lead to believe that a bee does not gather pollen and honey at the same time, or, better said, on one trip. He has killed scores of pollen-laden bees as they entered their hives, and never found any more honey than one is likely to find in worker-bees when they leave their hive.

Another of his observations may be of interest. He stated that, by painstaking counting, he found pollen-gathering bees to visit from 3 to 5 times as many blossoms as honey-gatherers.

BEES, AND SPRAYING FRUIT-BLOOM WITH ARSENITES.

In the States where bee-keepers are awake to their interests they have, I believe, succeeded in having laws passed against spraying fruit-trees while in bloom. This they accomplished on the mere strength of their *belief* that bees would be and had been poisoned by visiting sprayed bloom. Positive proof that bees were ever poisoned was really lacking. But, as Prof. A. J. Cook says, "We spray potato-vines with poison, and the bugs disappear. We do not make a post-mortem examination to find out whether the dead bugs have Paris green in their stomachs, but are satisfied with the apparent result of our spraying, and the fact *that the bugs are gone.*"

We have taken the same ground in the case of bees. *The trees had been sprayed, and the bees have died as the result.* Many scientists, however, have not been satisfied with our opinative proof. They refuse to accept what bee-keepers thought they had good reason to believe. The Ohio Agricultural Experiment Station has now published the experiments they have made in order to test the matter, and they hereby furnish the missing link in the chain of proof now available. How minutely and extensively the work was carried out may be judged from the few following facts: Separate analyses were made of thorax, posterior legs, and abdomens of bees which were known (or at least strongly suspected) to have died from arsenical poisoning while working on the sprayed bloom. The bees were first washed in three different ammonia waters to ascertain whether any poison adhered to the bees' exteriors, and to remove such. In some cases slight traces of arsenic were found in the ammonia water. Thoraxes and also posterior legs, with the pollen adhering, analyzed gave *no traces of arsenic*. This is contrary to my expectations. I should surely expect the pollen to contain poison as well as the honey. In stored honey taken from nearly ruined colonies, no traces of arsenic could be detected; but the abdomens of bees analyzed revealed unmistakable traces of the poison.

In summing up, the station says: "We believe that we have the first conclusive proof of the effect on bees of the use of arsenical poisons in the orchard while trees are in bloom. We can see no other conclusion that can be drawn from the result of our experiments than that bees are liable to be poisoned by spraying the bloom of fruit-trees, the liability increasing in proportion as the weather is favorable for the activity of the bees; that all bloom must have fallen from the trees before the danger will have ceased."

The bee keepers of our land owe the Experiment Station of Ohio a vote of thanks.

One more point I wish the station had not been silent on. I should like to know the whole truth. It would interest me to know how much of a crop these trees, sprayed while in bloom, bore as compared with the others not so sprayed. Our esteemed friend E. T. Abbott said at the Buffalo convention, that a fruit-blossom is so delicate it can not even bear a drenching of water, much less of Bordeaux or Paris-green mixture. If that is true, spraying it would necessarily and totally ruin the fruit crop, and no sensible fruit-grower would try that more than once. I, at the same time, gave expression to my view, that spraying the bloom might not prove to be so damaging to the fruit prospects as it would be useless and unnecessary work. The Ohio Experiment Station should be in position to decide that point. If the fruit-grower could be made to believe that he would injure his fruit crop by spraying the bloom, then, of course, he would not spray. But I believe it is always best not to exaggerate, but stay within the limits of truth, if we know what that is.

Naples, N. Y., March 26.

SHADE FOR HIVES.

Is an Excess of it Detrimental to the Ripening of the Honey? a New Phase of the Question.

BY A. NORTON.

Friend Root:—Some time last fall you gave a short editorial in favor of shade for hives. The point that you advanced in this instance was that shade makes cooler hives, and, therefore, calls for a smaller force of "fanners to keep up the ventilating air currents." I thought considerably of this at the time of reading it, and have quite often thought of it since. Please do not think I am antagonizing your views. It seems as if all

rate of evaporation. 3 (and consequently). With the temperature cooler, and the ventilating current lessened both at once, as per the supposition of your editorial, there would result a double decrease in the rate of evaporation inside. Therefore the honey would ripen thinner, or would need a longer time to ripen.

Now, there should be a point above which the temperature of air in the shade, together with its degree of dryness, sufficient evaporation in shaded hives, and below which they should be in the sun. And then, given the mean average daytime temperature of a given month at a given place, one could feel pretty sure how he should have his hives. I am not where such experiments could be made. The



DR. MILLER'S OUT-YARD; BEES IN THEIR TEMPORARY LOCATION PREPARATORY TO BEING REMOVED TO THEIR SUMMER QUARTERS.—SEE EDITORIALS.

the other eminent apiarists are with you. But I should like to suggest that some system of experiments be tried, to establish a delimiting point of mean average temperature, warmer than which shade is beneficial, and cooler than which it is undesirable. A definite knowledge of this part of the question would go far to define the influence of "locality." These principles may be safely stated in general terms regarding the force of "fanners" and the ventilating air currents:—1. With a cooler temperature in and around the hive, even though the ventilating currents should remain unchanged, there would result a corresponding decrease in the rate of evaporation in the hive. 2. With a lessened ventilating current, even though the temperature should remain unchanged, there would result a corresponding decrease in the

average summer temperature at Monterey is so cool, and the difference between summer and winter so small, that there is not the variation needed for experiment in this line. But, as many apiarists of experimental tendencies live in climates of great summer heat they could test the matter in spring, summer, and fall, thus having all degrees of variation to facilitate observations. I am satisfied that for Monterey, and even much warmer summer climates, I should always want hives in the open sunshine. And I think I have demonstrated in my own experience, not only here but in branch canyons of the Salinas Valley, where summer weather is very much warmer, that the same *bees* that in the sunshine will bear manipulation with perfect calmness will *very* often in the shade resent handling, with great

viciousness. I well remember how, in past years, Mr. Wilkin used to keep his numerous colonies without shade in hot inland canyons where the temperature in heated spells would be 110 to 115 in the shade. In the hottest weather he would ventilate at the covers. I remember a few cases of melting down; but the percentage was very small. So far as evaporation in the shade is concerned, it would go on better in the dry air of his Sespe canyon, for instance, than in the humid warm summer air of the Eastern States. But I bring up Mr. Wilkin's case for illustration, not for argument against you. He might now agree with you. There must be some basis for shaping definite principles regarding shade and sunshine whereby there need be no disagreement or vagueness of views, each applying the principles to the different conditions of climate, and thus harmonizing what would otherwise seem to be opposing views.

Monterey, Cal., May 2.]

[Of course, this is a question that hinges a good deal on locality. In some places, perhaps shade would be a positive detriment—especially so if it reduces the number of fanners that would be required to keep up the requisite amount of evaporation of the nectar. But in this locality, and for most localities, I do not believe there would be any danger along these lines. Here, for instance, the summers are very warm, and we have been told they are almost as warm as they are in the extreme south. This, taken together with the sultriness of the atmosphere, and the almost entire absence of breeze at times, very often causes the bees to hang out in bunches in front of the hives if they are not properly protected by shade or sufficiently wide entrances. Many and many a time I have seen these single-walled hives out in the open, that had almost all the bees on the outside of the hive. There were a few fanners at work, but they seemed to be discouraged. A cluster of bees would hang all over the entrance, and nearly close it. In this way they would loaf for several days, and pretty soon the swarming fever comes on, and then they are good for nothing the rest of the season or until they have swarmed.]

As you probably know, I do not advocate excessive shade. I would have the hives in our locality in a grove of young trees, or moderate-sized ones, and so situated that the rays of the sun will strike the hives at about nine o'clock and again at three. As our trees do not leave out until the middle of May, the automatic shade does not come on before it is required. In a word, I have advocated shade for localities like our own, to keep the bees from boiling out in front of the hive, and hanging in great clusters loafing, and clogging the entrance. For that reason I have advocated wider entrances and moderate shade. Under these conditions, if I have made no mistake in my observations, the fanners can do their work comfortably and easily, and a full force of them will keep up the air currents, and all the bees will be either in the hives or out in the fields.

Where we have colonies out in the open, we

arrange to have them in double-walled hives, with a chaff cushion on top; and I am not sure but this arrangement, all things considered, is the best for comb honey; for the double walls with packing on top retain the heat over night, permitting the bees to keep right on with their work in the supers. But such hives are, to a greater or less extent, unwieldy, inconvenient to move to outyards, take up room in the apiary, and, more than all, are more expensive.—ED.]

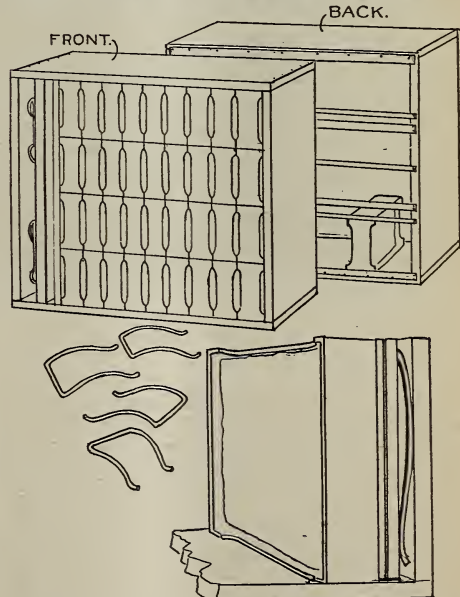
SUPER SPRINGS, INTRODUCING-CAGES, ETC.

When and by Whom were they Introduced? a Practical Form of Super Spring.

BY W. D. WRIGHT.

Some time ago I noticed in GLEANINGS that there was some question as to who originated super springs. I will not attempt to decide that point. I will say, however, that I first saw them in use by the Hetheringtons, some time before I used them. These were flat steel springs, similar to a piece of clock-spring; and, if I remember correctly, they were about $\frac{1}{2}$ or $\frac{5}{8}$ inch wide, and fastened to the follower. The round wire spring was original with me (and may have been with others also), and I shall claim priority until antedated.

Mr. Danzenbaker probably saw my clamp-spring at Mr. Mendleson's, as he took a sample home with him when he returned to California from the East, a few years ago, and expressed himself as much pleased with them.



I send you a photograph of the identical clamps, springs, and separators, built by me in the spring of 1883. At that time I constructed about 300 of these clamps, have used them more or less ever since, and have used no other for several years past. According to recent

developement I am not so much out of date after all. For my use I would not have the spring secured to either the clamp or follower, on account of the inconvenience of getting the follower or the last row of sections in or out of clamp, and especially out, after being glued fast by the bees. With my arrangement I can lift out the spring, tip the follower back against the side of the clamp, and manipulate sections readily, which is sometimes desirable, especially between the clover and buckwheat honey crops, when honey is but partially finished. It is also more convenient in filling or emptying clamps generally, and, to my mind, greatly overbalances the inconvenience of having a loose spring. I allow $\frac{1}{2}$ to $\frac{3}{8}$ inch space for a spring behind the follower, and have a strip of tin secured to the bottom of the clamp to keep bees out of this space, so that follower is not glued to clamp on outside, neither are the springs glued fast. My custom is to place the convex side of the spring next to the clamp, and with ends against the follower, which brings an equal pressure to bear against the top and bottom of the same. The pressure is sufficient to hold the sections in place when the clamp is inverted, and I usually transport them in that position when filled with foundation, in going to out-apiaries.

My springs were made of No. 9 steel wire, coppered the same as that used for bed-springs, cut to proper length, and bent in shape with a small steel implement.

These clamps were originally made for the $5\frac{1}{4} \times 5\frac{1}{4} \times 2$ sections, placed in three rows of 8 sections each; but since they have passed, I have substituted four rows, of 9 each, of $3\frac{1}{8} \times 5\frac{1}{4} \times 1\frac{1}{8}$ sections, which are practically the same as the prevailing tall pound section; and the only objection that I know of to their being an odd size is the slight additional cost.

The change to this size of section necessitated additional strips of tin on bottom of clamp at the junction of the rows. My separators are of pine and basswood, $\frac{1}{8}$ inch, mill dressed two sides, and with insets for entrances as shown. I nail a separator to the clamp, and also to the follower, to form an entrance to the outer side of all end sections, which is done not only for the purpose of hastening work in the same, but also for providing free escape for the bees in smoking them out when removing clamps from the hives.

Apparently a number of bee-keepers who have recently described the wire-cloth-surface queen-cage for introducing queens are not aware that it was given to the public nearly twenty years ago, in proof of which statement please refer to the following article, reproduced from the *Bee-keepers' Exchange* for January, 1881, published by J. H. Nellis, at Canajoharie, N. Y. I consider the square cage strong enough for its purpose, if made of wire of suitable size, and superior for ready observation, to any cage covered all over its principal surface with wax, *a la* Benton. The ordinary wire cloth used for fly or bee screens is too light for any form of this cage, as the long raveled ends of wire are too easily bent out of shape.

Mr. Frank Benton, in his Manual of Apiculture, published by the U. S. Department of Agriculture, in 1896, gives an illustration of this cage in circular form, and recommends pressing the ends of the cage firmly against the adjoining comb, that it might not be pulled loose by the bees clustering heavily upon it, which precaution is well with a cage of the size then shown—viz., $1\frac{3}{8}$ in diameter, and with $\frac{3}{4}$ -inch projection beyond the comb surface; however, I have never had any trouble in this respect with the cage made and applied to the comb as directed in the article referred to, besides having the advantage of normal spacing of combs, which is very desirable when they contain much honey if the cage is to remain in the hive for any length of time. Mr. A. Norton, in Oct. 15, 1899, *GLEANINGS*, proposed making an opening with a gate in one side of this cage, to avoid mutilation of combs in liberating queens, which, however, is of little account, as the bees quickly repair the damage, and I should prefer to have a solid cage.

Altamont, N. Y.

[I thought it was conceded that Capt. J. E. Hetherington was the first to make use of springs in supers to bring about compression of the sections on separators; and from what you say it is evident that this assumption is correct. Mr. Danzenbaker freely admits that he saw the super springs at Mr. Mendleson's; but as these were flat he came home and had some made that were round; but at the time, he supposed he was original in the use of round wire springs.

But your detachable springs, made in the form of a bent letter U, it seems, are the best that have yet been devised. There is no doubt at all but it is an advantage to remove the springs entirely, so that the sections can be manipulated easily. Unless some one else claims priority over you, in the use of round wire springs, we shall have to concede the honor to you; at all events, it is proper to call them the Wright super spring, for indeed their construction is *right*.

With regard to the wire-cloth introducing-cage, I have long been aware that the idea was very old; for I think I remember seeing a description in the *Bee-keepers' Exchange* to which you refer, for it was at that time I began to take hold of apiculture, and to do my first writing on bees.—ED.]

A STRANGE MALADY; IS IT A NEW BEE-DISEASE?

BY J. M. HAMBAUGH.

Nearly one year ago a friend invited me to come and inspect a bee-yard which was in bad condition, and assist him in unraveling the mystery as to what ailed his bees. I availed myself of the first opportunity to do so, and found them as he reported, "in bad condition." At that time I had never seen a genuine case of foul brood, but I had read so much about the disease I felt confident I should

know it should the symptoms be clearly defined.

By way of preliminary I will say that the previous season, and up to that date, which was June 8, was very unfavorable for bees, the weather being too dry for plant-life development; there was a probability of this with neglect on the part of the bee-keeper for the demoralized condition of his apiary. At that time he had 35 or 40 colonies alive out of 80 or 90 the previous year, and those remaining alive were very badly diseased, both brood and bees. Dead brood in all stages could be found; but it seemed more virulent in the

it was probably caused by demoralization, and advised feeding. This we did, and a good rain which came the last of May started new life in the plants, and the bees soon began to gather honey from natural sources. As might be expected, there seemed to be a let-up of the disease, and the conditions improved, from what I could learn from the owner of the bees, who lived nearly 15 miles away, and I had almost forgotten the circumstance. When I chanced to meet Mr. N., a few days ago, he told me the disease had spread throughout his entire yard, and desired me to make one more visit and note developments that we might be



PHILIP LARGE'S SOLAR WAX-EXTRACTOR, HAVING A PROVISION FOR ARTIFICIAL HEAT BENEATH. SEE EDITORIALS.

brood in its advanced stages. Sunken sealed cells with small perforations and without perforations were numerous, and scattered all through the brood, and brood just commencing to gnaw out of the cell could be found dead. In very rare instances we could find a coffee-colored ropy cell, but they were so few, and there being no glue-pot smell, we decided it could not be foul brood. We also concluded that it might be demoralization, yet the disease lurked in hives well supplied with honey as well as in those scantily supplied.

To further satisfy ourselves as to the cause of the trouble we sent Prof. Cook a sample of the brood, with a minute description of the conditions as nearly as we could. His reply was, that it was not foul brood, but thought

enabled to locate the disease, and, if possible, find a remedy; and I will say that, after a thorough investigation, we are still at a loss to understand the malady, and now call upon our big *savants* to enlighten us.

I will say that all the old conditions still remain, only in more virulent forms, and there have been 15 or 20 more colonies added to the death-list.

Another feature we noticed is that, in pulling a larva from the cell, we occasionally found its posterior of a greenish cast, and the old bees do not seem to stay on and try to protect their brood. Some of the old bees also seem bloated while others are the reverse as they tumble about the entrance in the agonies of death. Some have a shivering, staggering ap-

pearance, while others simply turn over on their backs and die. All this while their hives are well supplied with honey, the present winter and spring being very favorable in this respect. Mr. N. states that his first knowledge of the presence of any disease in the apiary was three years ago. He purchased some bees from a party ten miles distant. Shortly after he had brought them home he discovered one unhealthy colony. They were diarrhetic, and had symptoms of bee-paralysis. The brood also appeared diseased as stated. He says he is not sure, but he believes this colony inoculated the apiary. That this disease is highly infectious there can be but little doubt.

Now, friend Root, let us hear your opinion as well as others. There are no bees within three miles of this apiary. Mr. N. has one five miles distant, and he says they are perfectly healthy, and he knows of no other diseased bees in the vicinity; and I will say that in my experience I have met with nothing like it, and want some light shed upon this important case.

Escondido, Cal.

[The malady or disease, or whatever it is, is evidently not foul brood, neither do the symptoms seem to indicate *black* brood. Taking it all in all, I should consider this a new bee-disease. I would suggest that samples of the affected brood and bees be sent to Dr. Howard, of Fort Worth, Texas; that similar samples also be sent to Thos. Wm. Cowan, now in your State, editor of the *British Bee Journal*. His address is Pacific Grove.]

In the mean time your friend should take every precaution that the disease does not spread beyond his own yard; for according to his experience it must be a very infectious and serious disease; and if it should perchance get among the wild bees there is no telling where the disease would spread.—ED.]

AN IDEAL LOCALITY IN FLORIDA.

Objections to the Thick Top-bars in Hoffman Frames.

BY M. W. SHEPHERD.

Mr. Root :—Bees are doing well in this part of Florida, and to-day we have our hives built up three stories high, all full of honey. We have not yet extracted, having been too busy putting on supers and removing comb honey. The flow first started from *ti-ti*, followed by black tupelo, black gum, holly, haw, red bay, and yet to come are white tupelo, gall-berry, snowvine, palmetto, and several others of less importance. However, the white tupelo is the main source from which the great flow is obtained. It is usually extracted before it is sealed, and will weigh, when thrown from the comb, 12 lbs. per gallon, and will class as No. 2; and as it *never* granulates it is being taken very readily by the more extensive dealers, and at prices comparing very favorably with that of white clover. Just how many colonies could be profit-

ably kept in one place here has not yet been settled; but we know that 600 have been kept, and I have no doubt 1000 *could* be. The sources from which honey is obtained are almost unlimited. Of course, a poor season for gathering the nectar comes once in a while; but the nectar is there all the same. We have been keeping bees for the past 30 years, and our experience has been gained in Ohio, California, Colorado, back to Ohio, and, later, in Florida; and when we say that this section of Florida is ahead of any other place we have ever seen, we say it understandingly, knowing what goes to make a locality in which a bee-keeper will be successful.

It is not every place where the greatest yields are produced that always bring in the most money to the producer of the honey. Alderman & Roberts have kept 3000 colonies within a radius of a few miles, and have grown old in the business. There are many bees kept in box hives, and we have a few bee-men who say flowers produce no honey, but that it is honey-dew that falls on the bloom. They don't tell us why the dew never hits the leaves of the plant, but only the bloom. Perhaps the "king-bee" doesn't have it done that way. All bees have to be set up on trestles about two feet high, as the ground often gets overflowed with water; and sometimes two feet is not high enough, and hives, bees, and all start for some other place via the river and gulf.

Concerning the merits of the thick-top-bar frames to prevent burr-combs, we will say that on some colonies it does prevent, and on others there could be no more burrs, braces, and bridges built if the top-bar were but $\frac{1}{4}$ inch thick. The Hoffman frame is no good down here. In fact, we want no self-spacing frame. We are told that the Hoffman frames can be picked up in pairs; and what of it if they can? How often do you want to pick them up in pairs? And what do you want to pick them up that way for? We fail to see any weight of argument in the idea. When we manipulate a hive we want to know what is on both sides of each frame, so we have to pick them up one at a time, and we don't want to have to pry each one off the rest. No doubt in many places self-spacing is all right, but not here.

Marchant, Fla., Apr. 17.

[Look here, friend Shepherd; you had better be cautious about telling how good a locality you have in your vicinity. It may be you will have others flocking to your field to "divide the spoils." It is interesting to know, however, that the locality is so good that it would support 1000 colonies in one place or 3000 within a radius of a few miles.]

Referring to thick top-bars, I am well aware they are not absolutely proof against burr-combs, and that some colonies will build them in spite of them. Having traveled all over the United States, and inspected various apiaries, I am very sure you are wrong in thinking that thick bars are no better than those $\frac{1}{4}$ inch thick; but with a majority of the colonies I have seen with thick top-bars, burr-combs were built very sparingly—so few, indeed, we may say they practically do away

with the nuisance. Of course, if there is some particular colony that seems to disregard the thick bars, that would be an exception to the rule, and would really cut no figure.

As to the Hoffman ends not being suitable for any hot climate, that point we have practically conceded for several years, and yet there are some who will have them in the sunny South. In Cuba most bee-keepers there insist on having them, although we have recommended unspaced or metal-spaced frames. —Ed.]

WHY NECTAR DOES NOT SECRETE FROM THE FLOWERS.

Do Moonlight Nights have Any Thing to Do with the Matter?

BY A. J. WRIGHT.

This question is raised on page 649, 1899, by Mrs. L. Harrison. I think the editor also asks the question somewhere.

The leaves of all trees and plants are the stomachs and lungs of the plants themselves, and in a sense are the parents of every blossom. The sap flows from the roots to the leaf-bud, and the leaf is formed, and in this leaf-stomach the sap is digested, and a change takes place (the delicate process can be observed with the microscope), and is then carried to the blossom-bud; and as the supply is kept up the bud unfolds into the perfect blossom. No surplus nectar is deposited up to this time, it being all consumed in the nourishment of the blossom until its full development, and, in fact, is not sweet at all. But when the blossom is perfected this juice is deposited at its base, and a chemical change takes place at night, transforming this juice rapidly into nectar, to be used up in various ways during the day—by the bees, evaporation, etc.

Now, I don't plant my vegetables in the moon, but in the ground; and I find that plants generally grow much faster during light nights than dark. I also find it is a fact that blossoms that come to maturity at the beginning of moonlight nights secrete large quantities of nectar, while others secrete little or none. Just why this is so, or what particular action this subdued light has, I am unable to say; but if you have any doubt on this subject, just carefully make some observations. I believe you have a grove of basswoods. Now, if these trees come into full bloom just at the commencement of moonlight nights, and the sky is clear during the whole time that the trees are in bloom, you will have a honey-flow from basswood; and just in proportion to the amount of moonlight will be the honey-flow.

My observations along this line confirm the views here given. I do not believe a particle of nectar is deposited in the daytime, but it is, as I have stated, deposited at the base of the blossom, and is carried off by various agencies during the day; and in many plants having but a small reservoir and few nectaries, it is exhausted early in the day, and no more

is deposited until night comes. A very familiar instance of this is found in buckwheat—bees seldom working on it after midday.

Bradford, N. Y.

[On receipt of the above it was submitted to our good friend Prof. Cook, who replies as follows:]

VEGETABLE PHYSIOLOGY; NECTAR SECRETION, AND UNDER WHAT CONDITIONS; HOW PLANTS BREATHE AND GROW.

Dear Mr. Editor:—In response to yours of Feb. 28, let me say that nature is so complex that we can not afford to be dogmatic. We often think we are sure of a thing, and suddenly awake to the fact that it was all a mistake. We are rapidly getting at the truth in nature by the slow process of accurate observation. We often draw conclusions too quickly. We are sick. We take a little medicine, get well, and for ever dose with and recommend said medicine. This often leads to great mistakes. Patent medicines are a terrible fraud upon the public, but in just this way are perpetuated from year to year, often aided by persons of whom we should expect better things. I fear your correspondent may have generalized too hastily. It takes more than one swallow to make a summer. To take up the points in the article *seriatim*:

The leaves are not in any sense a stomach, as I understand it. They may be called lungs, for they do take in the carbon dioxide, and, with other elements of food, form elaborated sap, or the nourishing material of the plant. The writer speaks of the leaves digesting food. Plants never digest food except in a few cases where insects are supposed to be digested and absorbed by the plant. The writer also speaks of the deposit of nectar from the sap. I do not understand this to be quite accurate. At the base of the flower are special cells or glands which take elements from the sap and form the nectar. We all know that the sap of a plant at the time of the blossom and the nectar in the flower are quite different materials. Again, it is quite a new thought that moonlight is necessary for the secretion of this nectar. I am sure that I have noticed many times very rapid nectar secretion when there was no moon at all. I would not care to say that moonlight might not have a slight influence, but that it is material I greatly question. There are many plants, like the evening primrose, that secrete nectar only late in the day. These certainly do not depend upon moonlight for this power. I think there is no question but that the nectar is secreted to attract insects. The power has been developed in relation to the valuable work of insects in cross-pollinating the flowers. The nectar then will appear when it is needed to attract just those insects that visit the flowers and carry the pollen. Some flowers like buckwheat secrete almost wholly in the early part of the day, though even this is not always true. I hope all bee-keepers will observe this point, and I believe they will find that the matter of full moon has very little to do with nectar secretion. Maximum fruitfulness depends upon fullest cross-pollination. Such an important

function could ill afford to wait for the full moon to do its valuable work. Such a generalization as this ought never to be made until a person has observed over and over. Of course, full moon and other conditions favorable to nectar secretion may for several successive seasons be coincident. Your correspondent says, "I do not believe a particle of nectar is deposited in the day time, but is, as I have stated, deposited at the base of the blossom, and is carried off by various agencies during the day; and in many plants having but a small reservoir and few nectaries is exhausted early in the day, and no more is deposited until night comes." My observation has shown quite the reverse of this to be generally true. I have often seen even buckwheat yielding freely of nectar in the afternoon. Your correspondent speaks as though the nectar is secreted for the formation of the fruit and seed germ. I did not suppose this was at all true. It is secreted only to attract the insects. True, we have failure of the crop to fruit when nectar is not secreted. In this case the failure comes from lack of cross-pollination. What your correspondent says in regard to the nectar being secreted and reserved for the development of the seeds I suppose was entirely contrary to the real truth in the matter. I do not think that the seed germ is nourished at all by the nectar.

Dear Mr. Editor, this matter is of sufficient importance to warrant a few words regarding vegetable physiology. We know that plants need no digestion, for their food is wholly gaseous or in solution; and digestion is wholly for the purpose of changing food into a condition whereby it can be absorbed. The food of plants comes wholly from the earth or else from the atmosphere. From the earth come the water and the mineral elements, the most important of which are nitrogen in combined form, potash, and phosphoric acid. Lime and some other elements are also necessary, and are usually in our soils in sufficient quantities. We have to add the four elements, water, nitrogen, potash, and phosphoric acid unless they are already in the soil in sufficient quantities. The plant also gets carbon dioxide from the air, which is taken in through the stomata (the breathing-mouths) mostly on the under side of the leaves. It is generally thought that the leaves take in much water from the air. This is probably not true. On the other hand, an amount of water surprisingly large is constantly passing off from the leaves. A damp foggy morning revives the plant in times of drouth, as it lessens the amount of evaporation. In plants as in all animals, all the work is done in the cells, by the protoplasm, or substance which makes up the entire cell except the walls. This protoplasm consists of proteids, substances like the white of an egg, which are always present where work is done, either in plant or animal. These cells have the power to take suitable material into their substance whenever it is present as a gas or liquid. Thus the cells are constantly taking water, and the elements mentioned above, through the minute microscopic root hairs, modifying these and passing

them on through the outer cells of the sap wood to all parts of the plant, even to the very topmost leaves. The leaves also take in carbon dioxide from the air, which, with the crude sap from below, forms the material from which they produce the elaborated sap. In the leaf-cells, also in the green layer of the bark, there is, as one component of the protoplasm, the green matter, or chlorophyll. This has the power to form, from the carbon dioxide and water, the sugar of the sap, which, as we all know, is quite soluble. It is possible that these leaf-cells may also have the power of forming this sugar from the proteids of their own substance. We know that the liver-cells of the animal, while they form glycogen, or liver starch, much more rapidly from carbohydrates as sugar and starch, can also form it wholly from proteids. We know, also, that the plant cell and the animal cell are astonishingly alike in their function and in the products which they produce, and the methods of their work. The sugar in this elaborated sap is borne along through the cells, as already described, and carried to places of deposit, and transformed and stored as insoluble starch. It is also carried to the cells, and transformed into cellulose, which forms the walls of the cells and all woody tissue. This same elaborated sap is carried to the flowers, and the glands at their base secrete from it elements which attract the bee and other insects. The path of this sap is in the cambium layer, which is made up of the inner bark and very outermost part of the sap wood. The cells of the plant, like all tissue, either animal or vegetable, are constantly taking elements from the sap and building themselves up. They are also constantly wearing out by work just as the cells of our own body are being torn down by their own efforts. Thus the plant, like the animal, must have food or it starves. We lay a board on the grass. We soon find the grass blades devoid of green, and we know that the pallor means ill health. The chlorophyll has been used up by work; and as it can be produced only in sunlight from the carbon dioxide and water, the plants pale and die. The same is true of all cells, if any of the necessary food is withheld. The water of the plant, like the oxygen which we get through our lungs, is so immediately important that, without it, the plant soon withers and dies. We see, then, how necessary it is that our plants have sufficient water. Our soils, too, are often deficient in the three necessary mineral elements already mentioned, and thus the provident farmer sees to it that these elements, if not already sufficiently abundant in the soil, are generously supplied.

There is one other element of all soils that must be in quite large proportion for soils to be productive. I refer to the decaying organic matter known as humus. There are two ways of supplying this substance—either by use of stable manure or by plowing under green crops. By the latter method, we may also, if we use leguminous plants, furnish the combined nitrogen, which is the most expensive of the three mineral elements used in soil fertilization. Indeed, nitrogen costs about

double what we have to pay for either potash or phosphoric acid. Thus we understand why green manuring with leguminous plants is so immensely beneficial. It always pays well to plow under a large amount of clover, peas, or lupins.

(PROF.) A. J. COOK.

Claremont Cal., Mar. 6.

HOW TO CURE A BAD CASE OF ROBBING.

Prevention Better than Cure: Entrance-closers; a Practical Article.

BY S. T. PETTIT.

Several parties have written me for directions how to stop robbing and how to prevent it. These are important questions to the beginner, and the answers may also be helpful to some others. It is better all round to answer through the papers. It is a burden to reply in a private way.

There are various ways of stopping robbing. The condition of the hive being robbed should always be considered. In any case the first thing to be done is to close the hive so nearly that a single bee can with difficulty squeeze through, then treat the robbers the same way. There may be several hives taking a hand in the fracas. If so, look them up and punish them also. When the bees have quit flying toward night, open all up and let the robbers all go home; but watch, or in a few minutes they may go to robbing.

Again, at nightfall put the hive being robbed in a dark cellar, and leave them there for two days. In the mean time set an empty hive in its place. The hive in the cellar should be replaced on the stand in the evening when all is quiet, and place on entrance-blocks such as are described below. If the hive being robbed is a strong one, leave the entrance 3 or 4 in. wide, and cover the entrance with a small armful of hay or straw, and sprinkle liberally and often with cold water, and take it also to the dark cellar for two days. But to prevent robbing is better, and generally easier, than to break it up after it once gets started.

Less robbing will occur if the hives face to the south or west, or anywhere between these points, for the simple reason that the prevailing winds from these quarters will favor the guards in several ways; but the west winds are too strong for best results when the hives face in that direction, so I prefer facing them to the south. Then in the evening of the first day out of the cellar give each hive whose bottom-board is at all loaded with dead bees, or is soiled, a clean, sweet, warm floor. To warm it, it should be kept for an hour or more in a warm room. The change should be carefully and quickly made. Let one lift the hive straight up, and another remove one floor and adjust the other; then adjust the entrance-block. Take a walk around next morning, and see how bright and thankful the little creatures look. Their home floor is so sweet and clean! and their courage will be strong enough to defend it. A dirty hive is more likely to be robbed than a clean one.

The entrance and entrance-blocks are factors

that demand our careful consideration in this undertaking. The entrance should be about $\frac{3}{8}$ inch high, and no higher. To-day I send you a sample of what I consider the best entrance-blocks that I have tried. I do not say that they will in all cases prevent robbing, but they will materially lessen the nuisance.

If any one has much black blood in his yard I believe it will pay him to try these—that is, provided he has not something as good or better. I have a better in the shape of an addition to these blocks for very weak or queenless colonies, but there is not room for a description of it here. To make the blocks, cut a piece of lath an inch longer than the entrance. Cut this in two in the middle, then cut the corners back a little so as to form a V



next to the hive when placed in position. Now cut another piece one inch shorter than the first. Next, nail this on top of one of the first pieces. Have the outer ends even when nailing. Now place all in position, and the top piece will cover the V space next to the hive. Close the entrance, and draw a mark across the loose piece at the end of the piece above it, by means of which you can tell just how far you open the entrance when standing behind the hive.

As a rule, bees should have an entrance big enough to satisfy them. A generous entrance encourages them to defend their honey. With it they are more comfortable, and drier and warmer than with one that is too small. How can bees warm and dry themselves in a hive filled with a polluted atmosphere that can not escape? You might as well expect a Jersey to yield lots of good milk from poor hay and sawdust.

Aylmer West, Ont., Can.

[I believe you are entirely orthodox, friend Pettit, on the matter of robbing; but, as you say, preventive means should always be used where possible. A bad case of robbing is demoralizing to the whole ap'ary. After the bees have once gotten a taste of stolen sweets they are ever on the alert for more. It does not take very long to train bees to follow the apiarist about for hours at a time. I am sorry to say that we have had ours trained so they would follow the smoker; whole clouds of them, in fact, would follow it, for they seemed to know that, as soon as the smoker was picked up, it would be used over a hive, giving them a chance to get at the colony pell-mell. Our apiary is now so managed that there is never a case of robbing; and when the bees get to smelling around a little too much, work over the hives is suspended for the time being, or at least transferred to another portion of the yard.—ED.]



THE RETURN OF SPRING; BREEDING FROM SELECTED STOCK.

The cold winds that had blown from the north for several days had died away. The sun rose clear, and the sky was cloudless. A cock robin from a tree top prophesied a warm day, in boastful song. By nine o'clock the snow that remained was fast becoming liquid, and hurrying away to the great ocean by roadside and rill, as if the welfare of the world depended on its getting there in the least possible time. It was the 5th of April. The bees, too, were rousing themselves from their long winter slumbers, and one hive after another sent forth its scouts to see if spring had indeed come; and soon there was a general rush, and the air filled with that delightful hum that makes a bee-keeper's heart beat quicker and the blood in his veins tingle to his finger-tips. The bees were having a "fly." Of course, I was on hand to see if every thing went right, observe how strong they were, and notice if any had failed to be aroused by the warm spring air.

"Ah ha! How have they wintered?" came from the roadside—a voice that I recognized as Deacon Strong's.

"Pretty well, considering," I replied; "not nearly as well, however, as a year ago. I have noticed that bees usually winter well after a good season. As 1898 was one of our best years, during the spring of 1899 bees were the strongest I ever knew them; but as the summer of 1899 was the poorest for the third of a century our bees went into winter quite reduced in numbers. We can not expect them to come out very strong. There will doubtless be more loss this spring than usual."

"Bees making honey now like smoke, I reckon," said Dan Savage, as he went by driving a dirty pig, and heard the humming of the bees.

"Yes, making it from the last snowdrifts of the season," I replied.

"Have you selected your queen to rear queens from?" inquired Timothy Fasset, who had joined us.

"Well, no—not fully," said I. "There are a good many things to be taken into consideration. There is hive 19 that gave me last year more honey than any other hive in the yard; but I shall not use her for queen-rearing. It is a dark hybrid or low grade, and does best when we have dark honey, as last year. Had white honey been as abundant as usual there are others I am sure that would have surpassed this one; and as our crop is usually white honey it will be necessary for me to secure a strain of bees that work best on the clovers and basswood. There is hive 66. That is one of my old stock, and nearly or quite pure Italian. I have been thinking seriously of using her for queen-rearing in this yard. You see most of my queens in this yard were reared

from a queen I bought two years ago, and, of course, nearly all the drones will be like her. The queens I reared from her were all mated with drones from my old stock. Now, if I rear queens this year from one of the best of my old stock I shall get another cross with the drones of the queens reared last year from the purchased queen. For my out-yards I shall either use a queen reared from my purchased queen or perhaps buy a queen if I can find one that is desirable. I believe there is a good deal in crossing stock. Mr. McClure, in Illinois, has been making some very interesting experiments in crossing different varieties or breeds of corn. In crossing some fifteen different varieties he found the crossed seed to be much more productive than either kind without crossing—at least that was the rule; and crossed seed, when planted, averaged sixteen per cent more corn than the uncrossed seed. This probably comes largely from increased vigor of the plants."

"That's cur'us," said Fasset, "that every thing in this world must be kind o' jumbled up like—that is, every thing after its kind, the birds and beasts, and all the plants, in order to be strong and vigorous."

"It shows," said I, "the abhorrence of nature and nature's God to the marriage of near relations. Still, in our efforts for improvement we must not forget the great value of selection. Very little is said on this subject in our text-books on bees, yet I believe there is no more important subject in the whole round of bee-keeping, or one that requires better judgment or nicer discrimination, than the selection of a suitable queen to rear queens from, if we would attain the best results."

"Messrs. Rabbethge & Giesecke, the famous producers of sugar-beet seed, state that in 1889-'90 they tested 2,782,300 roots, from which they selected only 3043 for seed-growing purposes, or about one in 900. How many bee-keepers, do you suppose, would be willing to examine even one hundred colonies of bees that the best one might be used to rear their young queens from? Those who have not given the subject a little attention have but little idea how much care and thought have been required to bring the various plants and animals under domestication to their present state of perfection. The English wild gooseberry, for instance, weighs one-fourth ounce; yet in 1784 it had been so much improved that berries were exhibited, and carried off the prizes, that weighed half an ounce. They have now been so improved by careful selection of seedlings and cultivation that specimens have long since weighed nearly or quite two ounces, or eight times the wild berries."

"Take the sea-island cotton, known the world over as the finest cotton grown. The planters had first to change it from a biennial to an annual by selecting the earliest-maturing plants for seed. Then they have increased the quantity of fiber to twice what it was in proportion to its seed, and at the same time have greatly improved its quality, so that now the best grades sell at from fifty to sixty cents per pound. But to secure these results the greatest care is required in raising the best

possible strains of seed. When a field of this cotton is ripening it is examined, and all the most promising plants pulled and taken to one side, and these again are gone over more in detail, and a few of the best selected, which are again examined, and the lint and seed of each weighed, and the vigor of the plant, number of balls, etc., carefully noted down before a final selection is made, when the seed of the choicest plant is saved to plant in a plot by itself for comparison with other strains, and so on. Indeed, the system of breeding seed is quite complicated.

"In Germany, where the potato is used for quite a variety of purposes, it is often valued in proportion to the amount of starch it contains, and is sometimes sold, not by the bushel, but by the number of pounds of starch a given quantity contains. I understand they have improved varieties containing twice as much starch as others, and I see no reason why starch can not be increased in a potato as well as sugar in a beet-root."

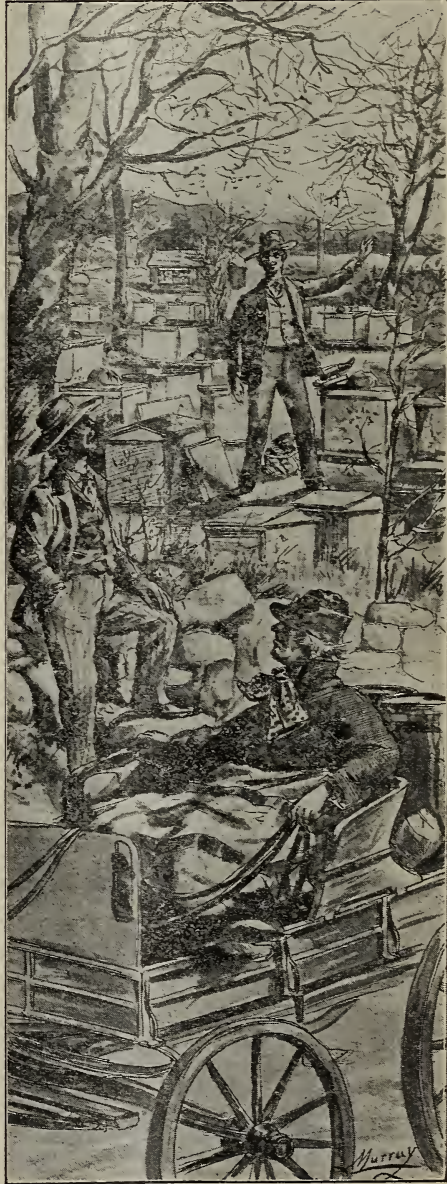
"There goes a bee in at that hive, with a load of pollen—the first I have seen this year," said Deacon Strong.

"That's so," said Fasset. "Got it off them alders down on the brook. I guess that means bis; but say, Uncle Lisha, that talk of yours is cur'us and pretty interesting; but why don't you tell more about improving animals and bees?"

"Well," I replied, "the same laws run through all plant and animal life nearly the same, and just as great care has to be taken to improve animals as plants. In Saxony, where they have the finest-wooled sheep in the world, the greatest possible care is taken in the selection of breeding stock, even placing young animals on a table every three or four months during their development, and noting down every thing that would help them decide the best animals for improving their flocks. But if you want an illustration nearer home, take that of the Experiment Station of New York. In 1874, or about that time, it established a herd of cows for dairy experiments. It bought just every-day-grade cows, such as the farmers had to sell—grade Jerseys and Holsteins. In 1874 this herd averaged just 3000 lbs. of milk per cow; yet in 1898, or twenty-five years later, the products of milk had increased two and a half times, or to 7575 lbs. of milk per cow. And this has been brought about, not by buying choice cows, but by careful breeding and selection, selecting the best heifers from year to year, and disposing of the poorest. How many bee-keepers can make as good a show? The average run of bees is doubtless as good for the production of honey as the cows that the New York experiment station started with were for dairy purposes. That bees are quite as susceptible to improvement as cows, I think no one who has given the subject much thought can doubt. Indeed, in the average yards of bees there is more difference between the best and the poorest colonies than between the best and poorest cows in average dairies. I noticed in Bulletin No. 169, from which I obtained the above facts, that their cows are all hornless. They propose to get

milk instead of horns, which are no more useful in a dairy than propolis is in a yard of bees."

"But bees are different from cows," said my friend Fasset. "You see, in raising dairy



"ARE HAVING A GOOD FLY."

cows they can use such males as they want, while with bees we have to trust to chance."

"That is true; but I believe the chances favor the bees. You see we may never know just the value of any sire for improving a herd until he is tested, which may require several

years; while with bees, if we discover a choice queen we can in a single season give to every hive in a yard a young queen from her. It is true these may mate with other drones; but we know that the following season all the drones will be of exactly the same blood, or nearly so, as our best queen, when we may secure another choice queen and get another cross where we are sure both drones and queens are the best attainable."

"Hello!" shouted Bill Carr, from the roadside. "Say, deacon, what will you sell me your horse Prince for?"

"One hundred and twenty-five dollars," he replied. "I paid that for him, and I consider him worth it still."

After bantering some time he offered the deacon one hundred dollars; and when the deacon refused he said he had always heard it was harder to deal with church-members than other people, and now he knew it was a fact. I noticed the deacon's face flushed, and his eyes flashed fire; but he didn't say anything, nevertheless.



NATURAL SWARMING VS. ARTIFICIAL INCREASE; STRAIGHT COMBS, ETC.

"Good morning. Is this Mr. Doolittle?"

"Yes, that is what they call me. But what shall I call you?"

"My name is G. A. Patten, and I come over from another town this morning to have a little talk with you about increase, comb building, etc., as it will soon be swarming time with the bees. Which do you prefer—natural swarming or artificial increase?"

"For the rank and file in bee-keeping I prefer natural swarming, as the bees can divide themselves to a greater perfection than it is generally done by the majority of those who practice artificial increase. Then, natural swarms seem to work with more energy and vigor than do those made artificially, even when they are made by the most efficient apiarist."

"But with natural swarming will not many swarms leave and go away to the woods or elsewhere?"

"Not if we keep the wings of the queen clipped; and there are very few apiarists of the present day, who work for comb honey, who do not practice clipping their queens."

"How do you care for swarms having a queen whose wings are clipped?"

"I hive the swarms by letting them return, previously moving the old colony to a new location and setting the new hive containing the full number of frames in its place, laying the wire-cloth cage containing the queen down in front of the entrance of the new hive. As soon as the swarming bees miss their queen they return, supposedly to their old hive of brood, but really to the hive we have provided;

and, finding their queen, they commence to run in, the same as does a swarm hived from a limb. After half or two-thirds have run in, the queen is liberated, when she runs in with the rest. No other plan of hiving swarms equals this for ease."

"But such a swarm, hived in this way, builds comb the same as any, does it not?"

"Yes. But with all swarms I open the hive on the second day after hiving, when I find that the bees have started comb-building in about five frames. These five frames I place together at one side of the hive, and a division-board is placed next to them so as to confine the bees to these frames. This throws the full force of bees on these five frames, and they will soon fill them with straight worker comb, as a general rule."

"I am very glad you told me this, for I did not have the means to purchase foundation to fill my frames full this year. But won't the bees be crowded in so small a space as the five frames allow?"

"If there are more bees than can work to advantage on these five frames, the surplus arrangement, or as much of it as is required, is placed over them, this last being a great help about securing comb having the worker size of cells."

"But will not the bees build crooked combs?"

"If you furnish each frame with a starter of comb foundation half an inch wide, and work on the above plan, not one frame in 500 will contain aught but a straight comb; for if you get the first five built straight you will have no trouble in getting the rest so, as they can build them in no other way, if placed between two of those already built."

"How about drone comb being built, Mr. Doolittle?"

"There is little danger in having much if any drone comb built in the first five frames, as hinted at before; and should drone comb be likely to be built in those put in later on, it will pay you or anybody else to fill these last with foundation; but I think it pays well to use only guides in the first five. If you can have every comb a straight one, and all of the worker size of cells, such a colony will be a profitable one, or a 'lucky swarm,' as our fathers and grandfathers used to term them. If you attend to this comb-building the first season, you will have all *profitable* swarms. See?"

"But if a man has only a few colonies, will it pay to thus fuss with them?"

"No man or woman contemplating keeping bees, even when having no more than two or three colonies, should consider a colony in proper working order until each comb is a straight worker comb. There is no need of having hives half full of drone comb, and so crooked that they can not be handled. Do things in the right time and in a proper manner, and your bees will more than pay you for all of the time spent on them, even though you have but few."

"But your hives are better adapted to such comb-building than are others."

"I do not claim that the hive I use is the

best, by any means; but the method of getting comb built is the correct one. Allow me to illustrate: Suppose a large swarm comes out when basswood is in bloom, and you hive them without paying any further attention to them, as is usually done; they will build comb very rapidly, filling their hive in eight or ten days, as I have often known them to do, and their combs will be quite apt to be crooked, and at least one-third of the drone size of cell, used the first year mainly for store comb. Such comb is good for nothing for raising worker bees the next season, and is an actual damage, as the drones reared therein will consume a great part of what the workers will gather. Such colonies will be unprofitable ones, either for raising bees or storing honey, just so long as the combs are allowed to remain in that condition."

"Your shutting bees on only a part of the frames contained in the hive is something new to me. Do you do this with any but new swarms?"

"Yes. Both new swarms and weak colonies in the spring should have only a few combs as they can cover and be a little crowded, especially those swarms or colonies where combs are being built, for in this way the combs which are begun are rapidly carried forward, rather than starting more to go slowly and be finished off with drone comb. If the bees are likely to crowd out of the hive on account of too little room, put on a part of the sections, and this will be an additional security against the building of drone comb. If any man expects to realize a large income from his bees, and never look after their condition, simply hiving the swarms and putting on the section boxes, he will find himself greatly mistaken."

"I did not suppose there was so much involved in bee-keeping to be successful."

"But you look after your horses and cows very carefully, and why not the bees? Bee-keeping pays only when our pets are properly cared for, and with this, as with all else, success can be achieved only by untiring energy. But here comes friend Jones! Good morning, Bro. Jones. What are you studying on this morning?"

"I have been reading what you said on p. 216 of GLEANINGS regarding how you treated all colonies which do not have an amount of brood equal to $2\frac{1}{2}$ frames full. Now, what I wish to know is what style of frame you alluded to."

"I alluded to the Gallup."

"That was what I thought. But the Gallup frame is not so large as the Langstroth, so your $2\frac{1}{2}$ frames of brood would not amount to more than two where the L. frame was used."

"You are quite right; and if I had a colony of bees (on the date spoken of in what is found on page 216) that had more brood (in four or five frames) than enough to fill completely two L. frames, I should consider such a one good enough to come up to perfection in bees, in time for the honey harvest, without any of the treatment required for weak colonies."



HONEY-TRUSTS; AN EXPERIENCE THAT WAS NOT ALTOGETHER FAVORABLE.

Of late there is considerable talk about honey-exchanges as being the great remedy for our financial troubles. As California is given as a sample of co-operative success, perhaps my experience and observation might be of some interest. Sooner or later we are apt to have a national honey-trust. We are used to getting the favorable side; and now a mild warning from one who has lost a little might have a tendency to keep some one else out of a pinch.

In 1895 some of us concluded to try a new plan of selling honey. The plan adopted was not altogether to my liking; but I went into the combine, as it appeared to be the best thing in sight. We gave our written promise to G. X. Wendling, at that time a lumber merchant and bee-supply dealer of Hanford, Cal., to turn over our honey to him to sell at such price as we should name, honey to be stored at such point in Kings Co. as he should select. It was argued that we should get car lots in the warehouse as soon as possible. In fact, the only thing in writing was the power of attorney over our entire crop. We were to pay a fixed salary to Mr. W. for his services when they should be needed, also for printing, etc.

Of course, there was some expense in storage, insurance, etc. The bulk of the contracting parties avoided that expense when honey was worth four cents by ignoring their agreement and keeping their honey at home. Two, possibly more, stayed with the deal to the end of the season. I estimated my loss on the combine at over \$180. We had been in the habit of selling along as we extracted, and would probably have done so that year; but so many wanted to see how it would come out first, that we came out at the little end of the horn—mostly at three cents or less. When last interviewed, Mr. Wendling used language more forcible than elegant in talking of the honor of bee-men as he had found them average.

That convinced me that it is better to try a corporation where each member *must* do as he agrees, if possible.

The next year gave me a chance to join the State Exchange, at Selma, and I would have done so, but feared my extracted honey would not sell well when nearly all the other honey was in sections. It was a sad sight to see much of that fine comb honey, damaged, of course, and begging a cheap market a year later. The Exchange was accused of holding the price above the market.

The California Bee-keepers' Association, A. M. Gilstrap, of Selma, Sec'y, is a new corporation, and reports indicate that it is a benefit to its members already.

W. A. H. GILSTRAP.

Grayson, Cal., April 23.

NOT A TRUST, BUT AN EXCHANGE.

I don't like the word "trust" very well, as spoken by Mr. Cogshall on page 259, but a bee-keepers' exchange conducted on principles like the dairymen's exchange for butter and cheese. Let the bee-keepers of a county (or larger section) organize and meet at some central point, say once a month during the honey-flow (this being exchange day) bringing samples of their products with them. The dealers will meet them there, offering to buy, the co-operative principles of the exchange fixing a price to the local dealer, or in carload lots to go to the larger markets. Mr. Brown, in his "Benefits of Co-operation," page 260, gives us some good thoughts on this subject.

Dexter, N. Y.

W. R. GLADWYN.

VOIGT'S SWARM-CATCHER.

Blocks made like the inclosed drawing, and suspended under the foliage from small branches, vines, or wires stretched from one point to another as occasion requires, are fine swarm-catchers. Most of mine were secured in that way last season.



The fact that 15 swarms clustered on a post over which a grapevine grew suggested the idea. I shall have 15 or 20 among my hives this spring, and avoid much trouble in taking swarms from the trees and posts. Why they cluster on such places I am unable to say, but they do.

WARD VOIGT.

Jackson, Miss., Mar. 19.

BELGIAN HARES; SOY BEANS, ETC.

Though in some quarters I think the Belgian hare business is just now boomed a little too extravagantly, I can indorse, in the main, both Mr. Greiner and yourself. I have been raising those hares some six years. They are easily and cheaply kept, and my stock in that period has varied from a dozen to sixty or more each season. I do not allow them to run at large, but have a warren inclosed with

a 4-foot fence, about 2×3 rods in area; and in one end, under a shed, I have a lot of breeding-hutches two tiers high. They furnish a very fine article of meat—white, tender, and as toothsome as chicken. When full grown they reach from 6 to 12 lbs., live weight. Then they have skins as tough as a wood-chuck's, nearly, with fine fur—much used of late in tanning for trimmings for ladies' garments, to which the name "Electric Seal" has been given, and it is nice.

The past two seasons for honey-raising have been poor in this immediate vicinity. I have secured only what I call about half an average crop. Just now the prospect looks better for this summer.

Usually we winter from 12 to 21 colonies, in chaff hives; and in seven successive winters we have not lost a colony in that way. The business, however, here, is not very tempting, the bee-pasturage not being over-abundant.

SOY BEANS.

I find that they will thrive nicely on soils that are quite sandy; are good nitrogen-gatherers, and hence I believe them to be valuable for fertilizing. But the variety that I have tried will be best cut for fodder here—the season is not long enough to ripen them. But they will stand up strong and green through the severest drouths we have here.

Muskegon, Mich.

ALBERT BAXTER.

BELGIAN HARES.

I tried to raise them, but the weather was too hot and damp for them here, 60 miles south of Chicago. They would do all right in winter; but as soon as warm weather came their throats swelled, and they coughed and died, and I had great trouble to get them to breed. You have to keep them in a pen with a tight floor, as they will burrow a long way, and bark all the trees they can get at.

Essex, Ill.

S. H. GREGSON.

HOW TO FIND QUEENS.

To find the queen in a nucleus is a very easy thing, which I do as follows: First remove the division-board, then lift out and look over the frames as you come to them, setting them on the outside of the hive; or if robbers are bad, set them in a comb-bucket. Many times queens are harder to find in nuclei than in full colonies, very often being found on the side walls or bottom-board.

If I am to find a queen in a full colony, if they are Italians and not too numerous I proceed as with the nuclei. Where robbers are bad I find it a very good plan to discard the tin covers to the comb-buckets, and use a cloth kept wet. Now, if the full colony is very strong, or is black, or the bees poor hybrids, I proceed as follows: First smoke the hive a little. Place a queen-excluder between the top and lower stories; raise the cover, and smoke the majority of the bees down; then look carefully over the combs for the queen. If not found, next smoke or drum the most of the bees into the top story where the queen can be found very quickly by looking over the combs. Very often she is found on the ex-

cluder. This plan has never failed to save me much time and labor, especially when dequeening to prevent swarming, or when queens are to be gotten out of box hives, etc. Of course, where colonies are not already two-story, a hive-body can be used the same as if it had been two-story already. In the latter case we know the queen is in the bottom story, and half the labor is saved. H. H. HYDE.

Hutto, Tex., May 19.

ANOTHER METHOD OF FINDING QUEENS.

Mr. Editor:—Noticing your query in issue of May 15, whether any method has been devised for finding queens, I give the plan I have followed for many years where the queens were wary and the bees frightened, and inclined to run about the combs. I remove the hive containing the colony a few feet from the stand, and set an empty hive in its place. Then, beginning with the outside comb covered with bees, I scan it carefully for the queen, changing it to the hive on the stand formerly occupied by the colony. The bees on the combs remaining to be examined are thus not disturbed by the bees that are in a state of agitation by handling, as it is the bees on the returned combs that start the disturbance of a colony. In this way one can go over every frame in the hive, and have no alarm except upon the combs already handled.

I seldom have to look more than once, where this plan is followed, before finding the queen in any colony; whereas one comb taken out and returned in the usual manner starts such a rumpus with the whole colony, especially if it is very populous, that the task is rendered doubly difficult. There may be some better way for finding queens in black and hybrid colonies. If so I should be glad to know of it. I have Italianized many apiaries in the course of my bee-keeping experience, and this method of searching the combs is the best that I have in practice. B. F. AVERILL.

Howardsville, Va., May 20.

[I have tried the methods suggested by Mr. Hyde and Mr. Averill, and in some difficult cases may use any one of them; but ordinarily, if the bees are Italians or hybrids, it is not necessary to go to the trouble of using excluders or removing the hive from its stand. But if we try once and fail on a colony I sometimes use one of the above methods.—ED.]

HONEY FROM FRUIT-BLOOM.

I notice in last edition of A B C that you say apple-blossom honey is all right for breeding purposes, etc., but of very little or no value for table use. Now, I fear the writer of that article has never seen any genuine apple-blossom honey. We often get a good flow here, so we extract some, and this season we have an extra good one, and my colonies have stored at least 35 lbs. each on an average during the past ten days, and I call it a very nice heavy-bodied fine-flavored article.

I send you a small sample by mail, which please show to the writer of the article I refer to, with this letter. We have extracted between 300 and 400 lbs. of this the past week

from 20 hives, leaving them with at least 20 lbs. in their combs, and it is all genuine apple-blossom, as they were so short we were feeding before the bloom commenced. I should like your opinion of the sample.

Colrain, Mass., June 4. W. W. CARY.

[The item to which you refer in the A B C was written by A. I. Root for the earlier editions, and it has stood without contradiction until the last year or so. Some one else, I do not now recall his name, wrote that the honey from fruit-bloom was very nice, and he sent us a sample as proof. Referring to the one you have sent, we have all tasted of the honey, and consider it light in color and fine in flavor. Indeed, it emits the same aroma that one smells in an orchard in full bloom. I am inclined to think you are right, and have therefore marked "Fruit-bloom," in our A B C book, for correction.—ED.]

WHY THE HONEY DID NOT CANDY.

Can Dr. Miller tell why my honey didn't candy last winter? Of course, it got a little thicker, as all syrup or honey will in cold weather; but there was no sign of candying, although it was kept in a cold place (below 0) in Mason jars. The honey was light-colored white-clover honey, which generally candies very easily. Some buckwheat honey which was not so well ripened by leaving on the hives candied hard as usual. E. E. EWING.

Rising Sun, Md., May 12.

[Dr. Miller replies:]

Some kinds of honey do not candy, but that doesn't apply in the present case, for this was clover honey. I suspect that the reason your honey did not candy was because it was extra well ripened. I have seen clover honey that passed through a zero temperature throughout a good share of the winter without showing any signs of candying. It was kept in a place that is very hot in summer and very cold in winter—in a loft next the roof. The intense heat of the summer had ripened it so it would not candy.

Will bees swarm without a queen, and, when put into a hive with a frame of unsealed larvæ, raise a queen? I mean by this, will they do it when the parent colony is hopelessly queenless? M. W. SHEPHERD.

Marchant, Fla., Apr. 17.

[Yes, bees in rare cases will sometimes swarm without the queen; but the instances are so very rare that we may almost say they *never* do without one. Why, yes, if the colony is queenless, and hopelessly so, and has a frame of unsealed larvæ, what else could they or would they do, but raise cells? In fact, we have always set it down as a rule that it is never safe to say that a colony is queenless until it has built cells; but we can not, of course, go too far in this, and say that whenever cells are present it indicates the absence of the queen; but if, outside of the swarming season, there are no eggs and no larvæ, and cells are built, and if the bees indicate a sort of nervous uneasiness, it is my rule to say the colony is *surely* queenless.—ED.]

POISONOUS BROOD; SPRAYING OUT OF BLOOM.

Friend Root.—What is the matter with my queens? I tried raising them by the Alley plan, and placed the prepared larvæ in good strong queenless and broodless colonies. Honey was coming in freely, and the bees started fully 100 cells in the various colonies used for that purpose. The cells were drawn out and sealed in due time, and at the proper time for cutting them out I found, without a single exception, the larvæ dead and rotten. Perhaps "rotten" is not the correct word, but anyhow they were a mush in the cell. There seemed to be a total lack of royal jelly in the cells. Now, why was it? is the question. The colonies were queenless, and had been for a length of time sufficient for all the brood to hatch out, and the colonies were very strong, and honey coming in freely, yet not one queen have I got out of the whole shooting-match. If the fault was mine, where was it? and if it was the bees', why was it? All colonies were perfectly healthy, and no disease has ever been in the apiary. We have to raise queens early, for later in the season the mosquito hawks are so bad as to make it impossible to do so.

M. W. SHEPHERD.

Marchant, Fla., May 22.

[We have had reports from all over the country as to how brood had suddenly died in certain colonies. Indeed, we have had it die in strong colonies in our own yard. It is something that disappears, or at least always has done so, and the colony is shortly in its normal condition. This trouble I lay to the fact that the bees have gotten the poison that has been used for spraying fruit-trees. While we spray while the trees are *out of bloom*, our Mr. Wardell says he has noticed that after each spraying there are liable to be dead bees as well as occasionally a dead queen, followed by dying or dead brood. When the bees are rearing large quantities of brood, if there is no dew or water handy they are quite apt to lick up the liquid poison on the trees, carry it home, and then the result is poisoned brood. Only recently one of our best queens that had been doing heavy duty was found dead out in front of the hive, and this was just after our trees had been sprayed. The assumption is that the bees of that colony had taken home some of the poisoned liquids, fed them to the queen and to the young brood, because the brood was dead also in the hive. We get reports of this kind every year during spraying time, and I am fast coming to believe that spraying does do some harm, even outside of blooming time.—Ed.]

BURNT SUGAR CAUSING DYSENTERY.

Early last fall a grocery was partially burnt near me, and a large amount of smoked candy and sugar was left in the ruins, and my bees worked in it for weeks. I was working my bees for increase and not for surplus honey. A neighbor who was running for surplus had his honey ruined by this burnt candy. We both winter in the cellar. He has taken his out, and they appear to be in bad shape. I think mine are badly affected with dysen-

tery. Do you think the burnt candy and sugar are the cause of our poor wintering? A year ago our bees came out of the cellars in fine condition. I suppose if the burnt sugar is responsible for our loss it is too late to do any thing for those that are alive.

Athol, Mass., Apr. 10. A. M. V. HAGER.

[There is no doubt that the burnt sugar was the cause of your trouble. You will find further particulars on the subject of burnt sugar in "Feeding," in our A B C of Bee Culture.—Ed.]

A CHEAP HOME-MADE FOUNDATION FASTENER.

Mr. Root.—Inclosed I send you a photo of the foundation fastener with my ten-year-old boy at the machine.

R. D. WILLIS.

Montrose, Colo.



[This is a very simple machine, so simple that almost any one can make one from a glance at the engraving.—Ed.]

DOES 1200 INCHES OF COMB MAKE TOO SMALL A BROOD-NEST?

I wish to ask you a few questions. I am using a hive that gives me 1199 inches of comb in the brood-chamber, 11 frames. Do you think it too small? Will it make bees swarm sooner if you feed in the spring? My bees are what I would call fighters, from the woods, or black bees. Do you think them as good as the Italians?

E. EVELAND.

Boomeveld, Wis.

[I should say your brood-nest was of fair average capacity. The eight-frame Langstroth hive is perhaps nearer standard than any other on the market, and has 1120 square inches of comb.

For general purposes we do not consider the black bees as good as Italians or crosses between Italians and blacks. The last named are just as good for comb honey, and some prefer them.—Ed.]

YELLOW SWEET CLOVER.

I have demonstrated that yellow sweet clover is not an annual, as some writers have claimed, but a biennial, the same as the white variety. I have now a small plot of the yellow in my garden, which is two feet in height, and will soon be in bloom. It blooms from two to three weeks earlier than the white, which is a desirable feature. It grows a finer stalk, but not so tall as the white. My plot of the yellow was all destroyed, except one root, in Feb., 1899, by the hard freeze; but whether it is less hardy than the white I can not say at present. I can say this, however, that it would be a difficult thing in this locality to make the average farmer believe that the white variety ever winter-kills.

M. M. BALDRIDGE.

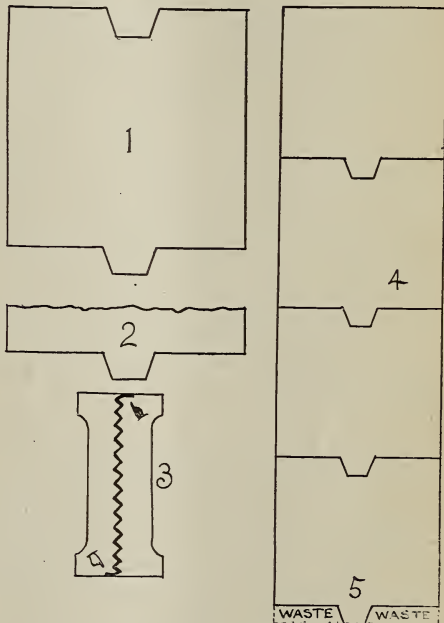
St. Charles, Ill., May 23.

SHADE FOR BEES; A NEW WAY OF CUTTING FOUNDATION.

I have been very much interested in the discussion of several topics—shade for bees, and foundation in sections being of particular interest to me, for I think I have solved the problem of both. I want my bees to be where the sun will shine on the hive all day. I paint my hives white, and have the entrance facing east. With the division board on the south side of the brood-chamber, and the follower on the south side in the super, and a shade-board the size of the hive cover on top, I have almost a double-walled hive except on the north side, which never receives the direct rays of the sun. Hives prepared as I have described above will stand 112° of heat, and will never melt down combs of honey or foundation starters, and will give several more pounds of surplus honey per colony than if they were put under some bare tree where they will be in the shade most of the day. A very small tree might do tolerably well; but I should prefer only a shade board on top of my hive. In supers filled with plain sections and fences I nail a six-inch board to one side of the shade-board to protect the south side of the super in the absence of a solid follower.

There seems to be quite a difference in opinion as to how much foundation to put in sections. I have tried inch starters, two-inch starters, and full sheets. I find that bees will begin drawing full sheets much quicker than starters. Last season I contrived a new way to cut foundation for full sheets so as to have it fastened to both top and bottom of the section, one sheet of super foundation filling four $4\frac{1}{4} \times 4\frac{1}{4}$ sections with scarcely any waste. The accompanying drawings* illustrate the knife for cutting, also the manner of cutting and fastening into sections. I fasten with a Parker fastener, placing the upper edge of the foundation under the press first, then turn the section upside down with the other side toward the press, and fasten the small projection in

the same manner. There will be an opening left in the foundation at the top of the section; but the bees will fix this up so you will never know that an opening ever existed. I had several pounds of honey, built on foundation as above, on exhibition at four county fairs last fall, and secured three first and one second premiums. The greatest advantage gained by cutting foundation this way is having the combs of honey securely fastened to the bottom of the section. I hauled several supers



full of honey a distance of six miles in a lumber-wagon, over frozen roads that were as rough as I ever saw, and not a pound of honey was broken loose from the section, nor a drop of honey leaking from any section. Really, I expected to find it pretty much jammed; but I was agreeably surprised when I took the sections out.

E. F. PITTMAN.

Cantril, Ia., April 23.

[I am not sure but your method is all right; but I do not see how it is you do not have bulged foundation. If you use extra thin I should feel almost sure it would bow out—at least sometimes. However, it costs but very little to try the plan, and I hope our bee-keeping friends will give it a test.—Ed.]

What makes my bees kill their drones now, when there are so many flowers, and the bees have plenty of honey?

E. P. PRINK.

Plover, Wis.

[If there is a light flow of honey, and it is suddenly cut off, even though there are flowers in bloom the bees will be likely to kill off drones. The very fact that honey-bearing flora are in bloom is no evidence that they are also secreting nectar.—Ed.]

* No. 1 shows a full-sized sheet of foundation ready to fasten into the section. No. 2 shows the blade of the knife for cutting foundation. No. 3 shows a cross-sectional view of foundation after fastening it in the section. No. 4 shows how one sheet of foundation is cut.



PERHAPS you have not noticed it, but we have been giving eight extra pages during all the spring and early summer, and we shall probably continue doing so for some time.

REFERRING to the Hakes-Heddon honey matter, see page 446, Dr. Mason says I misunderstood him if I got the impression from him that Hutchinson wrote that he was not sure the honey came from us. But Mr. Hakes says that *part* of the Hutchinson honey probably came from two sources and sends letters from Mr. Hutchinson to him, in which the latter says the honey was some he produced himself, and some he bought. But so far as the real issue is concerned it makes no difference whether it came from us or not, as Mr. Hutchinson would not knowingly sell adulterated honey. From all the evidence now in our hands, it is very doubtful if that last sample (that was analyzed and pronounced adulterated) ever came from Hutchinson; for there is no real proof that his honey was in any of the jars that were on the shelf from which the sample was taken.

THE CANKER WORMS ON THE BASSWOODS; OUR BASSWOOD ORCHARD ALMOST A FAILURE FOR HONEY.

THE canker or measuring worm is making rather bad work in our basswood apiary. Thousands of them are at work on the leaves, and nearly the whole orchard of about 3000 trees is infested with the pests. It is somewhat of a question whether we had not better spray the whole orchard, comprising as it does ten acres of land. It might kill the worms, but would it pay?

By the way, that fond dream of A. I. R.'s, of 25 years ago, of a basswood orchard, has never materialized, or never, I should say, come up to his expectations. It probably would have done so if the land had been underdrained in the first place, and the shoots had been cut away from the body of the trees. There are but very few basswood buds to be seen this season, and I am sorry to say I have not seen buds on any basswood-trees in our locality to amount to any thing. I do not, therefore, expect that in Northern Ohio there will be much honey from that source.

Later.—Since the foregoing was written we have had some hard heavy rains, and the canker worms have disappeared almost entirely; but we can easily see the effects of their work in the curled and partially eaten leaves.

HILL'S CELL-CUPS; THE IMPORTANCE OF LARGE ONES.

MR. H. E. HILL, editor of the *American Bee-keeper*, and one of the members of the Southern Bee Company, at Fort Pierce, Indian River, Fla., has sent me some specimens of Doolittle cell-cups which he has made, which are more accurate, and more nearly perfect,

than any thing I have ever seen before, and that is saying a good deal, because our friend Pridgen has come very near reaching the acme of perfection. Speaking about size, they are large with large bottoms. Our Mr. Wardell says he thinks that large cups are better than small ones. The cells not only look larger, and are larger, but he thinks the queens themselves that are reared in them, because of the abundance of room which they have enjoyed during their babyhood, so to speak, have thus an opportunity to develop in a way they will not in cells made from smaller cups. Said he, "You will remember that swarming-cells are always large roomy affairs, and that the queens from them are monstrous beauties. I believe Doolittle is right in urging the importance of rearing queens according to nature. Give me the big cups—the big roomy ones."

Later.—Mr. W. H. Pridgen, Creek, N. C., has sent another assorted lot of cell-cups or "goblets," as he calls them, that are fully the equal of those submitted by Mr. Hill. The former says he can make them any size and any shape by the peck. We shall probably offer cell-cups for sale, but in the meantime I would suggest sending direct to Mr. Pridgen and to Mr. Hill, the latter at Indian River, Florida.

THE DEVIL AND THE DEEP SEA; THE GLUCOSE TRUST.

I HAVE heard about being "between the Devil and the deep sea;" but here seems to be a case where the two parties are at war with each other. Possibly these designations of the two contesting factions are a little severe; but the majority of the syrup-makers are as much competitors of the honest honey-producer as the glucose trust itself. Of the former there is a class who are also venders of so-called honey, which they label as "Pure Honey," "Farm Honey," and a score of other innocent nice-looking names. Well, here is a clipping from one of the dailies, and I only hope they may war themselves to death, but this they will never do. But we as bee-keepers can stand back and say, "Sic 'em!"

CHICAGO, June 2. — Seventeen Chicago syrup-makers and scores of syrup-makers in other cities, representing hundreds of thousands of dollars of invested capital, have seen their business almost destroyed as the result of a war of extermination started against them two months ago by the Glucose Sugar Refining Co., known otherwise as the glucose trust. Within the last sixty days, so the syrup-manufacturers say, the glucose trust has gone into syrup-making, and has put up the price of raw products and reduced the price of syrups to its customers to such a degree that the other syrup-makers are unable to do a satisfactory business.

Affairs of the syrup-makers, however, have reached such a crisis that a meeting of the principal manufacturers of the United States, who are organized into the National Syrup Association, has been called in Chicago early in July to devise some method of fighting the trust and resuming satisfactory business. In the meantime twelve out of the seventeen Chicago syrup-factories have practically closed their doors, and the remainder have given up syrup-making and gone into other lines of business.

APIS DORSATA ON THE WAY TO AMERICA.

ONE of the American soldiers with whom we have been having some correspondence, de-

tailed for duty at the Philippines, has made arrangements for the sending of one or more *Apis dorsata* queens to us. To save a long journey across the continent, and to give the queens every opportunity, we have arranged to have them sent to W. A. Pryal, of San Francisco. I wrote to him, asking if he could receive the shipment, take care of the queens, give them a rest, and allow the bees a flight for a few days or weeks until they could recover from their long journey, at the end of which time to send the queens to us. In reply he writes as follows:

Mr. Root.—Your note of a fortnight ago was duly received, and I have been daily expecting the announcement of those bees from the islands. They will receive suitable attention when they arrive. I am thinking of having them installed in the grounds of the mayor of the city. His beautiful place is a block up the street from our office. 'Twill be a good place in more than one sense in which to introduce them to the best portion of the United States. While he might extend to them the freedom of the city, an exception must be made against the queens. W. A. PRYAL.

In a few weeks' time we may expect that there will be a shipment of the giant bees to the United States. They may all be dead, because we do not know how well such bees can stand confinement or long journeys. But the effort is worth the trial. Mr. Pryal is an enthusiastic bee-keeper, and will, of course, give the bees every possible attention.

I hope we may have the full text of the mayor's address of welcome to our shores. Hip, hip! Hold on! We will not throw up our hats yet, for may be our chickens will not hatch, and our gilded air-castles may fall ingloriously to the ground.

THE HONEY SEASON FOR 1900; PROSPECTS NOT FLATTERING.

ALTHOUGH it is a little early to make any predictions as to the honey-flow, owing to the lateness of the season, yet present indications would seem to show that the supply of white-clover honey will be rather limited this year. Walter S. Pouder, of Indianapolis, who is in close touch with a large area of country, writes, "There is scarcely any white clover in Indiana, Southern Ohio, and Illinois. The outlook is discouraging, and business is growing lighter." Owing to a lack of rains, H. G. Acklin, of St. Paul, Minn., wrote us a rather discouraging letter a week or so ago. Since then there have been good rains, but I fear they are too late to do much good unless with basswoods.

The season in California will be better than was at first expected; and especially is this true for the northern and central portions of the State. The rains finally came in the southern part, but too late for the amount of good they might have done.

Black brood has got such a start in certain portions of New York that many of the bee-keepers are discouraged; and even if there is a honey-flow I fear there will be but few bees to gather it. F. A. Salisbury, of Syracuse, N. Y., reports that prospects are not flattering.

In our vicinity I have seen almost no white clover out, although there are a good many patches of alsike; but these patches are so limited I fear they will not yield much honey.

Although this is the 13th of June, our bees at the home yard are getting but very little honey, and the same is true of the out-yard about two miles north of us; but at a yard owned by Mr. Boyden, secretary of the Root Co., some honey has been gathered, but he says his bees are not doing much now.

While all of this looks very discouraging, yet it must not be forgotten that the season is unusually late, and there is yet a chance for a fair honey-flow, because the greater portion of the country is being visited with frequent and warm rains. These will have a tendency to stimulate clover, resulting possibly in a slow but continuous nectar supply for a considerable length of time. It should also be remembered that it is a little early yet for most places for clover.

By the way orders have been coming in from Colorado, from the L. A. Watkins Co., Denver, it would seem that indications, at least for that State, are exceptionally good. As the bee-keepers there do not have to depend on rains, but on irrigation, in all probability they will have another heavy honey-flow; and I would say to the bee-keepers of that State, do not be in a hurry to sell your honey; for if there should be little or no honey in the East, you of Colorado will have things largely your own way. With your splendid organization and fine honey, it is evident that the honey-buyers will have to take the honey at *your* price.

On receipt of this issue I should like to have our subscribers from every portion of the country write us about 10 or 20 words, giving the prospects for a honey-flow and whether the indications are good; or, if the season is past, whether any honey was secured or not. I should like, in our next issue, to give an exact report for the whole country.

Don't, *don't* write long letters, as it takes time to summarize the contents of hundreds of letters.

These reports are very important, and bee-keepers will confer a great favor on the industry and on the trade by telling of the nectar supply. If honey will be scarce, those who do get a crop will be able to gauge prices accordingly. In any case, don't sell too low.

PHILIP LARGE'S SOLAR WAX-EXTRACTOR; BELGIAN HARES; COLORADO NOTES RESUMED.

OWING to the crowd of other matter I have been obliged to discontinue my Colorado notes for the time being, and I will now pick them up where I left off.

Mr. Rauchfuss and I made a stop for a day or two at Longmont, a locality at the foot of the towering Rockies in which are kept thousands of colonies of bees. At this place reside J. E. Lyon, Philip Large, and J. B. Adams. All of them are prominent bee-keepers; and while there may be others I did not happen to meet them. We stopped for half an hour or so at Mr. Large's apiary. While here I could not help noting the effect of the Colorado climate on the pine lumber—the checking and the warping—especially the hive-covers. But

the thing that attracted my attention was Mr. Large's solar wax-extractor, something of his own devising and make. Of this I took a picture, the half-tone reproduction of which appears in another column.

Its manner of construction will be apparent. At the back end there is a cupboard door communicating with an air-tight compartment. In this, if I remember correctly, Mr. Large had a big lamp which was placed under the slanting pan of the extractor. The heat from this lamp, combined with the strong sunlight from above, causes every particle of wax to be melted. Mr. Large was greatly pleased with the working of his extractor, and well he might be. The neat trim appearance of the machine shows him to be a mechanic. Indeed, in the same yard I found his edge tools—planes, etc., on a bench outdoors where he leaves them right along. This would look shiftless in Ohio, but every thing is so dry in Colorado—no dew and no rain, or comparatively none—that leaving tools out thus is quite the orthodox thing providing there are no thieves about.

It was at Mr. Large's also that I saw those mammoth Belgian hares. I had seen them at other places, but thought but very little about them at the time; but knowing what I now do about them I would have plied Mr. L. with one hundred and one questions. Those he had were mammoth in size; in fact, they seemed to be almost as large as a shepherd dog. They were confined in little pens, and all they had to do was to eat and grow.

It was at this same place that I first saw real Colorado irrigation. I had seen the ditches, but at the time I was visiting the State no water was running to speak of. Mr. Large started the water to going in the ditches in his garden, for my special pleasure; and then I saw for the first time how utterly impossible it would be for an ordinary windmill to furnish enough water to irrigate even a small plot of ground. Mr. Large used, I should say, a thousand barrels of water to irrigate just a small garden-plot once. Why, a little eight-foot windmill would not be in it.

In our next issue I will tell something about our drive to the foothills near Longmont, and of the sandstorm which we went through; of the way J. E. Lyon and the other Coloradoans winter their bees.

FOUL BROOD ON THE INCREASE IN THE UNITED STATES; A CAUTION ABOUT SENDING SAMPLES OF BROOD THROUGH THE MAIL.

I DO not like to pose as an alarmist, but it is evident that foul brood is on the increase throughout the United States. A few years ago we heard of it only occasionally here and there in isolated places; but now we get from three to five letters a week with samples of brood, the writers asking whether it is the dreaded disease or what it is. I have run across one or two samples of black brood, or what I thought to be such. I have seen a number of cases of what I suspected was poisoned brood; but, worse than all, a large number of samples of late were real foul brood.

By the way, I wish to caution our friends about mailing suspected samples of brood to us. We do not object to having them sent us, but *comb must be wrapped in absorbing cotton and then packed in stout wooden or tin boxes*. Just the other day a sample of brood came to our office, packed in a loose flimsy pasteboard box. The honey had leaked through, and the package was badly daubed when it reached my desk. It did not take me long to get it down near the boiler furnace, but, happily, it was only pickled brood.

While we have no foul brood in Medina we hope all the friends will be kind enough to see that each specimen of brood is carefully wrapped in absorbing cotton, and then encased in tin or wood—not pasteboard. Common spice or cinnamon tin boxes, oblong, with square corners, answer very nicely; but even then the brood should be wrapped in absorbing cotton or in paraffined or waxed paper.

We are very glad to help our subscribers, and think perhaps it would be well for any one who has a doubt as to whether he has a contagious disease to send a sample of the brood to us, for I think I can tell all cases of foul brood, and diagnose pretty closely on black and pickled brood.

Just as I was dictating these words a bee came in and hovered over the fresh ink with which these shorthand tracks are written. I wonder if it smelled what we are talking about. Well, now, suppose that this sample of brood in a leaky package that allowed the honey to run through had been placed on *my* desk while I was absent, and suppose it had been foul brood. Do you think for a moment that that bee would have gone away without taking a good big drink of the virus that had been imported through the mails?

If foul brood is on the increase in the country (and I am seriously afraid it is) the sending of nuclei ought to be discontinued. In New York State especially, colonies ought not to be shipped from one locality to another.

DR. MILLER'S GOBACKS; HOW TO MAKE THE WHOLE CROP OF COMB HONEY NO. 1; HIS OUT-YARD AND HIVE-MOVING RACK.

WHILE I was visiting Dr. C. C. Miller at his home, he and his sister Emma quite incidentally made reference to their "goback" colonies and "goback sections." Said I, with eyes staring wide open, "I should like to know what new-fangled thing you are referring to." "Gobacks," said the doctor; "haven't I ever told about them in the journal?"

"You have not," I said—"at least I do not remember seeing any reference to them."

It seems that, in taking off their comb honey, they remove the supers when most of the sections are completed. These are taken to the house, and the filled sections are set to one side to be scraped and cased; but the unfinished ones "go back" into the same or another super. There may be one or a dozen or perhaps a hundred or so of supers with partly filled sections, and these are all designated as "gobacks." They are either placed on top of other supers that are being built out from

foundation, or upon colonies that seem to show a special aptitude for finishing up gobacks.

In looking over Dr. Miller's hive-record book I found there were certain colonies that had produced so many filled sections and finished up so many gobacks. These gobacks are all placed on the hives *before the honey-flow ceases*; so when the season is over, Dr. Miller has nothing but No. 1 filled sections without any unfinished ones, or practically none, to be extracted, to be sold for less money, or to be filled out after the honey-flow by feeding back—a wasteful, laborious, and disagreeable job, because all has to be done during the robbing season.

Of course, there is nothing particularly new about placing unfinished sections on the hives, to be filled out; but, if I mistake not, the general practice is to place such sections on the colonies *after* the honey-flow.

Another interesting fact to me was that some colonies are much better for finishing gobacks than for filling sections from the foundation—that is to say, when work is apparently *started* or almost finished, those colonies show a special aptitude for *completing* work, but they are not as much inclined to *start* on raw foundation as some other colonies in the yard.

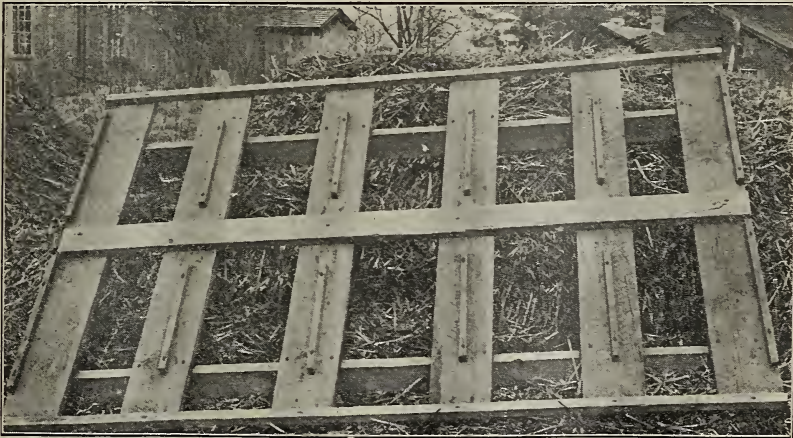
It seems that the Miller family have a way of finding out the peculiarities of each colony, and those peculiarities are recorded in the rec-

tricks of the trade that he knows, and supposes we all know. The word "goback" is suggestive, and worth coining, and you may be sure it will be used in the forthcoming edition of our A B C book.

Emma also gave me an interesting fact; and that, was when one has sections that from any cause have tiny drops of honey oozing from the cappings, to put them in a super, place the super on a hive for a few hours, when the sections will all be licked up clean and nice. It appears that the Millerites so manage that their crop shall be *practically all of it* No. 1 honey; and yet I suspect that over half of the producers of comb honey have anywhere from 10 to 25 per cent of it No. 2. A word to the wise is sufficient.

DR. MILLER'S OUT-YARD BEES.

After we had talked about gobacks I took my kodak and placed it on a step-ladder, or rather, I should say, a plant-stand, and took two time views of Dr. Miller's out-yard bees just as he had taken them from the cellar, and before they were moved out to their permanent location for the summer. In another column may be seen this apiary together with the home yard in the distance under the apple-trees. The hives on their temporary location are set out promiscuously, and then when they are moved to their "summer residence" they are placed in regular groups of two.



MILLER'S SECTIONAL, MOVING-RACK.

ord-book; and if the queen is still in the hive next year, that queen and her bees are devoted to a special kind of work—it may be to filling out gobacks, to running for extracted honey, if the honey is travel-stained, water-soaked, or discolored, or to producing comb honey from foundation at the start. The colony that is good both at producing honey and finishing gobacks is given light work, and its queen is used for a breeder.

Queer, is it not? that a prolific writer like Dr. Miller should not have told us about his gobacks; and yet I suspect this matter is like a good many of the other hundred and one

While I was rambling over Dr. Miller's premises I blundered on to his hive-moving rack. Although something similar is shown in the A B C book he has made some improvements, and I therefore took a snap shot at this, or, rather, a half of the whole rack, for it is made in halves for convenience in handling. The halves are placed together on an ordinary wagon, end to end. By the arrangement of cleats one can readily see how the hives are placed. It is a very simple and cheaply constructed affair; but, like every thing else that Dr. Miller uses, it is as good as the very best—that is, it answers every requirement.



Thy word is a lamp unto my feet and a light unto my path —PSALM 119:105

The forty-first annual convention of the Ohio Sunday-school Association was held at Akron, June 5—7. I should be glad to tell you of the great crowd we had there, and something about what the great speakers said. I should like, also, to tell you of the uplift it gives one to meet the good men and women from all churches and of all religious faiths. As I heard them speak and give testimony during the varied exercises, and tell about their churches, Sunday-schools, teachers' meetings, etc., in their own counties, it gave me a thrill of happy surprises. I really did not know there were so many, not only good men and women, but so many exceedingly bright and intelligent men and women, here in our own State of Ohio. I do not know but I have been dwelling too much of late on the *wickedness* of mankind. If so it was a good lesson to me to contemplate for a little time the *goodness* and *nobility* of mankind. One of the great speakers said many people would have it that the world is becoming wicked, and he declared that they were right. It is true that the world *is* becoming wicked. He said there were also very good people who declare the world is becoming *better*. Satan is making great strides with our new inventions; but Christianity is also making as great or greater strides, and therefore it is possible for both statements to be true. The wicked are growing wicked, and the good people are growing better; and the office of this Ohio Sunday-school Association is to pull the children *out* of wickedness, and plant and nurture them among the good. May God be praised for the small army of men, women, and children that are doing the work.

Some years ago I heard a good deal said about a lady who had wonderful ability in teaching the primary department. My impression is she was quite young when she commenced the work. So much was said in her praise that I expected great things when I first heard her. To tell the truth, I was somewhat disappointed. It seemed to me that she was too young to have charge or to be promoted, as she had been, to the position of handling so many of the little ones. I do not know but I said to Mrs. Root (of course I would be careful not to say it to anybody else) that this young teacher was a pretty good-looking girl and rather smart, but I was afraid they were making too much of her, and that she would get to be vain of her talents. And, by the way, I do not know but it is one of my infirmities to think the world sometimes makes too much of certain people. I remember a good many times when Ernest and others of the younger ones have thought I expected too much of quite young people; and they have predicted that, if I would just wait, I would

see that the world was right and that I was wrong. And this thing has happened. Quite a good many boys and girls have turned out a *great deal* better than I predicted they would, and I was not mean enough to feel bad about it either. I rejoice at such "happy surprises."

Well, Mrs. Bryner was one of my happy surprises. Years after I first heard her, she talked in our own church in some large gathering. After the meeting was over I told her how much I enjoyed her talk, and added I hoped the good people of our State and other States would give her sufficient support to enable her to keep *right on* in that work; and I ventured to ask how she was supported. Somebody said it was by voluntary contributions; and it was my privilege then and there to subscribe \$25, to be invested in keeping her before the people. Well, at this present convention Mrs. Bryner gave me another happy surprise. She was talking to a class of fifty or more boys and girls, ranging in age from five to ten years. The great church was so crowded that I could get only a partial glimpse of the speaker from a spot in the gallery. I could not hear all she said, and I am not sure that the text I have chosen is the one she used; but I think it will do very well. She captured every youngster in the lot almost in an instant. She did not capture me *then* and *there*, because she had done it years before. May I digress a little right here?

You know that, during the past few months, I have learned to love the flowers, and it has made my wheelrides much pleasanter during this month of June, because when I catch a glimpse of them around the homes as I ride my wheel, I know their names and know about them. Some object-lesson in the front yard indicates to me the possibilities of certain plants that I had never before suspected. And then I realize that, if I try hard, I may have something like it, and perhaps equal to it, in my flower-garden at home. Well, these glimpses give me the pleasant thrills I have told you about—thrills of praise and thanksgiving to God the great Father. Now, the sight of those good people at that convention gave me many such thrills. The good-looking faces and the pleasant smiles of both the men and women made me happy; and I think I shall do nothing wrong if I frankly acknowledge that so many good-looking girls and women—now, mind you, I mean by this girls and women who looked *good*—with their neat and tasty attire thrilled my very soul again and again. I should not care a cent for looks alone if they were not accompanied with intelligence and a love for humanity. When a woman, young or old, uses the power of her good looks and accomplishments in teaching the children the way from earth to heaven, can there be a happier or a more lovely combination? And this prepares me to tell you that Mrs. Bryner is a very handsome woman. I do not think she will feel offended, even if she should read this, for she will know—at least she will when she reads it all—that it is more what she *does* than what she *is* that makes her attractive. Please imagine a bright sprightly woman standing before these expect-

ant little ones. First she smiled at them, then put up her hand and shook it at them by way of a salute, and, of course, they saluted back again. Then she shook both hands, something as they shake their handkerchiefs at the Chautauqua salute. The children did the same. Then she asked them to stand up and give her a salute, and said :

"Now wiggle, not only your hands, but your arms, and do it real hard, as I do"

And what a fluttering and giggling there was among those youngsters!

"There," said she, "you have wiggled enough now, so that you can sit still a few minutes without being uneasy."

They all caught on to the point at once, and then she commenced her story.

"Children, a few days ago I saw some men at work in the streets of Chicago, and when it came night, so they were obliged to stop work, they left some great dark-looking holes right in the middle of the street. They had been at work at the gas-pipes and water-pipes, and things of that sort. And there were piles of sand and bricks and mortar, and pieces of iron. Then a man came along with a lot of lanterns, and put a lighted lantern on each side of these dangerous-looking holes. He set the lantern up on a pile of dirt or bricks. Who can tell me why he put the lanterns there?"

A lot of hands went up here, and a variety of answers came.

"To give the people warning."

"To let the people see where the danger was."

"To save them from harm."

After a great number of answers had been given she selected the one most appropriate, and placed it on the board. Then she asked :

"Who is to be saved from harm?"

One suggested the horses and buggies. When she asked who else, somebody piped out, "Boys riding bicycles." So she got a variety of answers. Then she had them tell what they knew about light-houses to give warning to ships. I was greatly astonished to know that among that mass of little people she gathered information in regard to light-houses that perhaps many grown-up persons did not know.

"Children, what people is it who carry lanterns all day long?"

Her class looked at one another in an undecided way, and finally some one piped out, "Miners."

"Where do miners carry their lamps?"

There was another pause while they studied the matter a little. Then some boy said, "In front of their caps."

"Will some boy please come up here with a cap and show us just how the miners fix their lamps?"

A boy came up, and the process was explained.

"What are the lamps made of?"

"Tin or other metal."

"How do they fasten the lamp to their caps?"

A juvenile voice replied :

"They have hooks on the lamps that hook into a place in the cap."

I can not take space here to give all the information she received in regard to this matter of shedding light in dark places in order to save human life. Some of the answers were not only unexpected, but exceedingly bright and original. Not only the children, but that whole vast audience, was so entertained that everybody forgot to be tired or to feel uneasy. Before she had dropped the matter of mere mechanical work and suggested a spiritual application, I was wondering in my mind how she would bring it in, and enable these children to grasp great spiritual truths. She did it, however, easily and naturally. While talking she was as busy with hands and tongue as any of the children. She asked if Sunday-schools were any thing like the lamps that give warning in regard to dangerous places. Then she spoke of the way in which the Sunday-school teachers, the superintendent, and all the officers could point out dangerous places. Then she asked what sort of person the superintendent of a Sunday-school ought to be. And those juveniles answered these questions after quite a little trying, with much wisdom and many original suggestions thrown in. Altogether they answered some questions better, perhaps, than the average minister would do it. Again and again I was startled by the wisdom, judgment, and good sense that she brought out from that little audience. One child would sometimes be "away off" in his answer; but another would right him up. Then a third would add something else; and a little girl, perhaps the smallest in the lot, would cap the climax in a way that "brought down the house."

When she came on the stage she brought some paper boxes of different sizes. Toward the close she picked up a fancy-colored box and commenced untying the string, saying, meanwhile, "Children, would you like to see what I have in these boxes?"

Of course, they were all on tiptoe with expectancy; she took out a very small wax taper and lighted it, then added, "This is a wee little light, not as large as the miner carries on his cap; but in a very dark place it would look much brighter and larger, and might help a good deal. I wonder how many of these little folks will be Sunday-school teachers when they grow up. Oh! there is a lot of you. Well, that little girl with the blue dress may come and stand by me and hold this little candle."

You can readily imagine how pleased the child was to stand by her bright animated teacher holding aloft her little beacon light.

"I wonder if there is a boy here who would like to be a *superintendent* of a Sunday-school some day when he is big. Superintendents ought to be very good men, should they not? They ought to be pure and clean men, so that they may let their light shine, and lead others away from danger. That boy with the pink waist thinks he would like to be a superintendent. He may come and hold this other candle. Now we need a lot of officers in the Sunday-school. We want a good bright boy for secretary. Let him come up and hold a candle too. Then if our Sunday-school room

is kept neat and tidy we must have another boy for sexton. He can shed the light of Jesus over his fellow-men just as well as the rest of the officers. Who will be sexton, and take this candle?"

In a little time the stage was filled with little folks bearing their lights.

"Finally," said their bright leader, "Jesus said, 'Go ye, therefore, and teach all nations.' May be some of you little folks here will go out as missionaries to foreign lands. Is there one little boy or girl who would be willing to go away from home and carry the light of the gospel to foreign lands? If so, let him or her come forward."

Some of the little faces looked sober at the thought of deserting home and friends; but they also looked serious and determined, and, as before, the volunteers came forward. After they were done, with an appropriate closing she told them they could blow out their candles and carry them home if they wished.

This may seem dull when put on paper; but Mrs. Bryner has had such large experience in holding children and churches full of people that she has become an expert in her line of work. The love of Christ shines forth, not only from every word but from every act; and no one who knows and sees her can for a moment doubt that her influence over these children will be a power for good as long as they remember that brief lesson and the bright woman who gave it. I suspected at the time she had a power that would influence older ones as well as the juveniles, if she chose to use it; and before the exercises of the day were closed my conjecture was verified.

Our State Association has been for years behind in its finances. It has called again and again on the separate counties to help them out. A good many of the counties respond promptly, and some pay more than their share. But there are others who are away down in Sunday-school work, and do almost nothing at all. Printed cards were scattered around among the audience, telling what each county had done. I was glad that Medina Co. was printed in black type, indicating that we had paid our full assessment; but I was pained to notice that many others had paid almost nothing. Permit me to digress a little.

At the close of one of the largest sessions the chairman called for contributions. He said there were something like 1500 people in the audience, and 10 cents from each one would make \$150, but we should probably not get more than \$100. Of course, some might not be able to give even the ten cents; but he thought there were others who would give 25, 50, or 75 cents, or even a dollar. I could not get a seat; and, standing where I was, I could see over the audience. Well, when I saw seatful after seatful refusing to give even a *nickel* my heart sank within me. I could not help thinking of a slang expression boys sometimes use—"We do not *have* to;" and I fear that was the trouble.

Now, hold on, friends. May be you think I am getting over into the same frame of mind I alluded to in the commencement of my paper. While I prayed for my fellow-men

I also prayed that God would give me grace to see things in their true light. And then it seemed revealed to me that these people, all of them, would respond liberally if they were *sufficiently aroused*, or if something could draw out their better feelings. Well, at the close of the last session we were told the debt hanging over the Association amounted to \$2500. I was appalled at this piece of information. But the speaker added that, right in the city of Akron, a man had been found so generous as to volunteer \$1250, *or half of the whole indebtedness*, if the people of that convention would raise the other half. *And the people did it.* It was, however, a long pull and a strong pull. The sum of \$1000 was raised during the day; and, if I mistake not, quite a good deal of it came from the business men of Akron. At ten o'clock on the last day of the convention there remained \$250. Half of it was raised without much trouble; and then it seemed as if everybody had got to the bottom of his pocket. I confess I was a little bit surprised when the manager of the matter suggested we should bow our heads and ask the Lord to help. I was surprised again when contributions started promptly at the close of the prayer. Then it seemed as if we absolutely could not get the last \$50. At this point Mrs. Bryner came forward, and one other lady to assist her. Mrs. Bryner handled that great audience of business men a good deal as she handled the juveniles. Not a word that she spoke or a motion that she made was in the least bit out of place; but recognizing, as everybody did, that she was heart and soul devoted to the bettering of humanity, and looking after the children of our State, how *could* her pleas be resisted? At the close we sang:

Praise God, from whom all blessings flow,

and then some one closed with a brief and excellent prayer.

And now, dear friends, although I have not had very much to do with this State Sunday-school Association before, may I be pardoned for suggesting right here that, since this debt is paid, we hereafter *pay as we go*, and do not, in the future, spend money, even for Sunday-school work, until we have it?

The Anti-saloon League has had an experience like the above, and I believe their motto now is, "Pay as you go." I do not know just how large a part of this \$2500 was paid by the business men of Akron—half of it, as I have told you, and perhaps the larger part of the other half. In the first place, the rest of the people of Ohio ought to be ashamed of themselves. Perhaps they can make it up by doing their part when this convention swings around their way. Secondly, the rest of the State of Ohio should give three cheers for Summit County and the city of Akron. Honor and praise should be given to the progressive business men of this enterprising go-ahead little city. And, finally, may God be praised for the business men who give their time and money to hold up the Sunday-school as a beacon-light to the boys and girls of Ohio so they may not stumble and fall because of the

temptations and pitfalls Satan has spread around them.



I was on hand at the Sun-day school convention mentioned elsewhere, just after dinner of the second day. The largest church in Akron was crowded to overflowing, and, in fact, they had overflow meetings some of the time. Now, it is a pretty hard matter for me of late to sit in a crowded audience during more than one sermon or speech of any kind at a time; and as a rule I do not like the sermon or speech to be a very long one. As the day was warm, the windows were swung partly open; but with the great crowd suffering for air it vexed me to think that somebody could not swing *all* the windows open as wide as they *could* be. Another thing, I could not hear the speakers unless they spoke very loud indeed; and many of the women (whom I most wanted to hear) I could scarcely hear at all. I was so far back in the crowd I could get only a glimpse of the speaker's face by dodging first one way and then the other. Finally somebody suggested that the women remove their hats, and then I made a discovery. I could not only *see* the speaker, without any trouble, but I could also *hear*, and I think I heard every word after the hats were taken off. I have thought best to mention this right here, because, even in our own community, there are some who have taken exceptions because our pastor asks the women to remove their hats. Well, I got along for another hour after the hats were off. Then I so longed for the pure air and the open country that I slipped out and was soon flying in the direction of relatives five or six miles east of Akron. Before I had gone far, however, it began to rain. But I pushed on for about four miles, until my Sunday clothes were getting such a wetting I climbed up on a porch to wait till the summer shower was over. I told the good people I just wanted to go over as far as Mr. Wolf's; but they informed me the family were at the convention in Akron. My conscience had been troubling me about deserting the great body of Christian people in the way I had done, so I just turned around and wheeled back to the convention faster than I went away. I have once before mentioned in the Home Papers that this particular family had recently united with the church, and become earnest workers in the Sunday-school, perhaps somewhat on account of my vehement urging. The man who owned the porch remarked, "I suppose you know the Wolf people are all great Sunday-school folks." Yes, they had left their farmwork in the very busiest time of the year to attend the convention, and here was I (after all my *talk*), playing truant. I went back and took my place in the audience, and behaved myself until after ten o'clock that night. The rain cooled the air. My

trip of eight miles had got my blood into excellent circulation, and the grand themes that were discoursed gave me, I trust and believe, a new baptism of the Holy Spirit. The good people of Akron furnished free lodging to all who attended; and as the number went into the thousands they had spread the people all over the city. I asked for an assignment over in the suburbs nearest my relatives, and at daybreak I was out on my wheel, this time with a clear conscience.

I found cousin Wolf's folks just getting up. Things in general all over the farm (more especially the corn and potatoes) were just "getting up" in good style, also. Notwithstanding taking a day off, or two days off, if you choose, to attend the convention, I think I never saw things look so nice before as they did on that farm. We discussed potatoes and strawberries; and after a nice breakfast such as none but a wheelrider (who starts off at daylight) can fully appreciate, I started off to Wilbur Fenn's, some five or six miles distant. He was in the cellar operating a new machine of his own invention for taking the sprouts from potatoes. I wanted particularly to see how he had managed in keeping the potatoes from sprouting during the recent exceedingly hot weather. He said he got along all right, and had very little sprouting, until toward the first of June. Then the long stretch of hot days, hot nights, and hot winds, raised the temperature of the cellar, and the potatoes all together started on a boom of sprouting. Shoveling them over did not seem to do them much good, and so he was putting them through the machine. Like myself, he had 200 or 300 bushels yet unsold; but he says he does not worry over such a quantity, even in the middle of June, nowadays, as he used to. People have learned for miles around that, when there are no more *old* potatoes to be had anywhere else, they can always get some at Wilbur Fenn's; and it is much the same way around here. It is now pretty well demonstrated that any piece of vacant ground will do for potatoes if we get at it about the first of July. Last fall we had an early frost, it is true; but this does not happen very often. People have discovered this, as I am saying, and therefore there are more and more people wanting late potatoes to plant. And this is not all. Even when new potatoes sell at the same price for table use as old ones, a good many prefer the old potatoes, especially if they have been properly cared for. Wilbur Fenn says potatoes for table use should be placed directly on the bottom of the cellar—no boxes or bins. Of course, the cellar, or that part of it, should be kept perfectly dark. We had the new Russets for dinner; and either my wheelride or Mrs. Fenn's skill in cooking or Wilbur's plan of keeping them (may be all three together) resulted in getting up the nicest dish of mashed potato, it seems to me, I ever tasted, and that, too, *in June*.

Now then. Somebody who would like the job can make a business of furnishing the people nice potatoes, either to plant or to eat, clear up into June or July. Of course, there should be a nice cellar made specially for keep-

ing potatoes; and such an establishment should be kept up within five or ten miles of every home, city or country. Where one advertises and ships potatoes, some kind of cold storage would be the thing. Of course, we can keep potatoes on the barn floor in good condition to plant, clear up into August, but they are not just the thing to ship. The sprouts would get broken off in handling, and they do not look tidy. By opening our cellar cool nights and keeping it shut warm days, we get along very well till about the first of June. After this there must be some kind of cold storage to keep the potatoes from sprouting and wilting. The friends in the South, where second-crop potatoes are grown, are calling every season for old potatoes through July and August. While seed grown the same season may be made to sprout, it is a difficult matter. A seed firm in Richmond, Va., has a cold storage for this very purpose, and they send out a catalog of old potatoes especially for planting either in June or July. Of course, there are seasons when old potatoes get to be very low in June; but this year nice cooking potatoes bring 40 or 50 cts. a bushel pretty readily almost anywhere, even if wilted and sprouted potatoes are somewhat of a drug.

MACHINE FOR REMOVING SPROUTS FROM POTATOES.

I think cousin Fenn will not object if I tell you how it was made. Get a common dry-goods box 6 or 8 feet long, about 2 feet wide, and a foot or less deep. Remove the bottom, and in its place put poultry-netting, with mesh small enough so none of the potatoes will fall through. Now balance it across the middle so it will work up and down like a seesaw. Put in half a bushel or more of potatoes, and with the seesaw machine make them roll back and forth from one end of the box to the other. The sprouts will be broken off and dropped into the box beneath. The end of the box furthest from you is made with a sliding gate, so that, by pressing down a lever, you can let the potatoes when done run out of the box at the further end. This machine takes the sprouts all off—that is, when they are long enough to break off readily, and puts the potatoes in one box and the sprouts in another. With some boys to pour in the potatoes and carry them away, the work can be done quite rapidly. The one we use is on the same principle, but it has a cylinder turned with a crank. I gave a picture of it on page 384, GLEANINGS for 1890.



THE EARLIEST STRAWBERRY.

And now it transpires that the berry that is earliest one year is not sure to be first to ripen the next season. I can not tell why this is so; but very likely the soil and method of handling have much to do with it. We have had

the Clyde for two or three years, but had about decided it did not possess sufficient merit to add it to our list. But this spring, when taking its chances out in the field with other varieties, it is not only the first to give us ripe berries, but the berries are very large and fine ones. Last year the Rio gave us the best large nice berries, but this year they are away behind the Clyde. One reason for this, however, is, the row of Rios is on the south side of the patch, and right close to it is a heavy stand of wheat. The wheat kept the sun off, and perhaps robbed the berries of moisture and fertility. The Darling, which has been one of our very earliest, was this spring on ground that has been for many years heavily manured with stable manure. This has made the soil so light it did not stand the drouth in May; and of late I have been telling the boys again and again that they must spade or plow deep enough to turn up some yellow clay to be mixed and worked in with the surface soil. A great deal of our ground that has been manured so many years is too light, and certain plants do much better in a rather heavy clay than in a soil containing so much humus.

MULCHING TOMATOES WITH STRAW.

I do not like muddy tomatoes any better than muddy strawberries. But tying up with stakes is more trouble and expense than we can afford—that is, if we have very many of them. I was just thinking of a mulching of straw when I saw the following in the *Ohio Farmer*, from W. J. Green, of our experiment station:

A straw mulch, put on as soon as the plants get large enough to interfere with cultivation, helps greatly. At the experiment station the crop was doubled in this manner. In ordinary seasons it would pay to buy straw, and use it in this manner at the rate of a ton to the acre. This is not all; the mulch is beneficial to succeeding crops. Coarse manure will answer the purpose also.

Brother Green is all right, although he does not allude to the agency of the straw in keeping the tomatoes *clean*. Now, I believe we can grow tomatoes without any cultivation at all after the ground is once well prepared. Work it up fine and smooth, ready for the crop, then cover your whole plot with straw a foot deep. Make holes down through the straw with your arm where you want your plants, and set the plant down in the ground, and let it grow up through when it gets ready. Of course, you want to stretch a line so as to get your plants evenly spaced. In this case you will have nothing to do with the plantation any more until you go over it to gather the fruit. I have worked this same arrangement with potatoes until I know pretty well I am right about it. This year our potatoes under straw were put in in the usual way, but rather closer together. We worked the ground, and tended them nicely until they were two or three inches high. Then we covered the whole surface with straw from an old stack. I waited a little later than I should have done, because I wanted the ground well soaked with rain before putting on the straw covering. The rain came about the first of June. A good many said I would smother my potatoes and kill them; but in a week they

were peeping out through the straw, looking as green and happy as could be. It is on the same piece of ground where I had the straw last year to kill out the dandelions. Only a few straggling dandelions are alive this spring; and after working the ground over it is perfectly clean. If this straw mulching absolutely prevents weeds of any kind from going to seed, our ground can give its "whole time and attention," so to speak, to the crop to be grown. Has anybody ever practiced mulching tomatoes with straw?

We have some beautiful-looking potatoes where we put a double handful of jadoo around each piece of potato when it was planted. They have made about the most rapid growth I ever saw potatoes make anywhere; and so far this season we have not seen a potato-bug to amount to any thing. When our first early potatoes came through, the boys found about a dozen bugs, which were promptly "executed." Since then there have been almost none. We do not mind the Colorado chaps so much; but I am actually afraid of the blister-beetles. We beat them out last season, but only after they had stripped the leaves from a good many of our potatoes, and it cost quite a good deal of money to get rid of them.

SOMETHING ABOUT GERANIUMS.

Mr. Root:—I notice in the April 15th issue of GLEANINGS your praise of the perlargoniums or "Lady Washington geraniums." I wish to tell you of one that I have at present in bloom that has over 100 flowers on now, and about two weeks ago there were over 200 flowers and as many buds at one time. It grows in an 8-inch pot, and stands about 30 inches high from the top of the pot, and nearly 24 inches across, nicely branched; and when at its best it was a perfect mass of blossoms. I traveled 40 miles the first of April to visit a greenhouse and see the flowers, and there was not a plant there that could compare with it for beauty. I also have an orange-tree with its fragrant flowers and little green fruit; also roses that were far nicer than all the other flowers. Princess Bonnie, with its beautiful crimson scarlet blossoms, and, oh so fragrant!

C. E. KELLOGG.

Spring Bluff, Wis., April 23.

IVY GERANIUM IN CALIFORNIA.

Mr. Root:—Like many others I am much pleased that you have taken up flowers. GLEANINGS has followed us to this far-away land, and I notice what you say of ivy geraniums. You may like to know that here there are many fences completely covered and hidden by them, and they are a mass of blossoms. One color is usually used for one fence. If in a corner, one color goes one way and another the other sometimes. We have found no apiary yet, but bees hum in the pepper-trees. I have been told they spoil the honey in some places, making it smart. What we called Love-tangle is here used to cover walls, or in great masses in place of grass. It has a purple blossom instead of yellow, as in Wisconsin. Bees are quite thick wherever it is seen.

MRS L. W. DENSMORE.

Santa Barbara, Cal., May 26.

INDIA RELIEF FUND.

The following amounts have been received for the starving people of India since our issue for May 1:

Friend	\$ 3 00
Geo. R. Moren, Waverly, Wis.....	10 00
C. Harriman, Durango, Ill.....	8 00
A. C. Williamson, Friendly, W. Va.....	5 00
Dr. Nuckols, Banister, Va.....	50
F. J. Creasy, New Plymouth, Idaho.....	1 00
Olive Thorn, St. Hyacinth, Canada.....	1 00
J. P. Cooper, Pikeville, Tenn.....	1 00

\$29 50

KIND WORDS FROM OUR CUSTOMERS.

STARVING INDIA, AND SOMETHING ALSO ABOUT STARVING BEES.

You seemed much interested in the Indian famine sufferers two months ago. In the *Christian Herald* of June 6, Mr. Klopsch says it is to be feared that the worst is yet to come when the monsoon floods come. "Having loved his own which were in the world, he loved them unto the end." It were little use to feed the famishing for a while and leave them in the day of calamity to perish. As well feed a hive of bees, and then in the spring allow them to starve for want of five or six pounds after feeding them fifteen or twenty in the fall, as I did, with many of mine last fall, and now many of the strong ones are dead—starved in April! What a sin and a shame! 150 good strong colonies dead! Like the Israelites in the desert, after being saved out of Egypt, and in a fair way to enter Canaan, they had not faith to make the final move; so I had not faith to venture to buy five or six barrels of sugar, so as to make sure they had plenty.

Well, their return to the desert life gave them lots of time for study, meditation, recreation, and improvement, having "angel's food" from heaven to eat, and no garments to make, though with me I believe I would rather place a super on a strong colony than to clean up a dead one, and watch for moths all summer with frequent regrets; but such is humanity.

Rev. Jas. Smith, a missionary on furlough from Ahmednagar (a school-mate of mine), in a letter says, "The Canada Methodists have sent less than \$20,000; the Presbyterians, \$100,000; *Christian Herald*, \$300,000 and a cargo of grain. This is magnificent; but the cargo of grain is but a drop in the bucket. A hundred cargoes are arriving daily; 1,000,000 bushels of grain a day are being sent into the famine districts. Pain and starvation are nothing when they work out spiritual gain, and these latter gains around Ahmednagar are enormous. We are seeing more accomplished in a few months than we hoped to see done in fifty years."

Little Britain, June 9.

R. F. WHITESIDE.

A VERY KIND CRITICISM, AND SOME KIND WORDS BESIDES.

Dear Brother:—Permit me to call your attention to a slight inaccuracy of statement in your last Home Paper, May 1. Three times, I believe, in that paper you mention Mark and Luke as in the company of the apostles. "Matthew, Mark, and Luke, were for some reason left behind;" "Matthew, Mark, and Luke thought they were," p. 359; "Matthew, Mark, and Luke, did not half try to cast out that demon," p. 361. I know that, as soon as I call your attention to it, you will remember that Mark and Luke were not only *not* in the number of the twelve, but were, in all likelihood not converted until long after Christ had ascended to glory. All that we know of their personal history is in connection with the labors of the apostle Paul—Col 4:10, 14; Acts 15:37, etc. This, however, does not alter the excellent and helpful teaching of your paper. Because the paper is otherwise so good and true, I like to see it free from all inaccuracies.

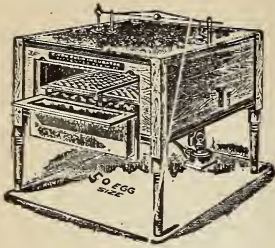
Let me take this occasion also to express my special appreciation of another of the recent Home Papers—the one in which you give your impression of David Harum. I have put that aside, and marked it to use as occasion serves. The world, the flesh, and the devil can not ask for more ingenious advocacy of their views and purposes than is found in David Harum.

I might remark on many others of the Home Papers which I have found helpful to me personally, and useful to me in my work as a minister. My prayer is that you may be long spared, and still "bring forth fruit in old age." Yours in the work of our dear Master.

R. A. LAPSLEY.

Greenville, Va., May 15.

[Dear brother, you are right, and I humbly beg pardon for my carelessness and thoughtlessness. While dictating that Home Paper I had before me Robinson's Harmony of the Gospels, and I read all together side by side the different accounts of the miracle as given by Matthew, Mark, and Luke. Without thinking, I somehow got it into my mind that when Matthew used the pronoun *we* in asking why they did not succeed, the *we* meant the three who tell the story, each one in his own way. I knew, of course, that Luke was not one of the twelve; but I hope you will forgive me when I tell you that I did not know, until you called my attention to it, that Mark also is not enumerated among the chosen twelve.]

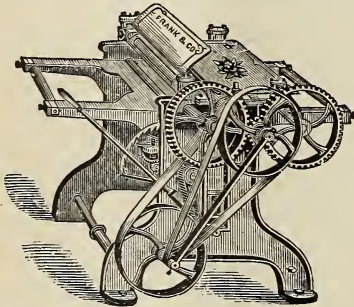


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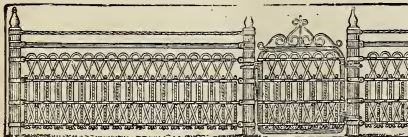
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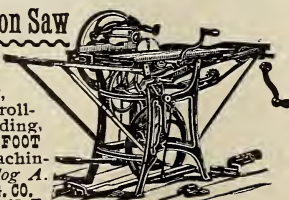
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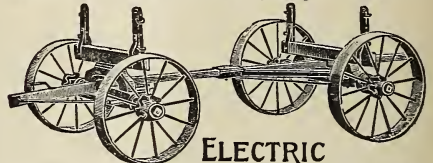
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